Summer 6-29-2023

Final 2023 Residential Metals Abatement Program (RMAP) Copper/Emmett Park Soil Remedial Action Work Plan (RAWP)

Pioneer Technical Services, Inc.

Atlantic Richfield Company

Mike Mc Anulty
Liability Manager

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Butte MT 59701
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June 29, 2023

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RE: Final 2023 RMAP Copper Emmett Park Soil Remedial Action Work Plan (RAWP)

Agency Representatives:

I am writing to you on behalf of Atlantic Richfield Company and Butte-Silver Bow to submit the Final 2023 RMAP Copper Emmett Park Soil Remedial Action Work Plan (RAWP). This submittal is in response to the Agencies' June 13, 2023, conditional approval letter of the Draft Final submittal dated May 17, 2023. The report and appendices may be downloaded at the following link:

https://pioneertechnicalservices.sharepoint.com/:f:/s/submitted/Ekkqd3IdOMRBsfYGrDZh4IYB8XYIEAZFIIFm_ueYkKZXlA.

If you have any questions or comments, please call me at (907) 355-3914 or Eric Hassler at (406) 497-5042.

Sincerely,

Mike Mc Anulty
Liability Manager
Remediation Management Services Company
An affiliate of **Atlantic Richfield Company**

Eric Hassler, Director
Department of Reclamation
and Environmental Services
Butte-Silver Bow

Atlantic Richfield Company

317 Anaconda Road
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Gary Icopini / MBMG – email
Becky Summerville / MR – email
John DeJong / UP – email
Robert Bylsma / UP – email
John Gilmour / Kelley Drye – email
Leo Berry / BNSF – email
Robert Lowry / BNSF – email
Brooke Kuhl / BNSF – email
Lauren Knickrehm / BNSF – email
Doug Brannan / Kennedy Jenks – email
Matthew Mavrinac / RARUS – email
Harrison Roughton / RARUS – email
Brad Gordon / RARUS – email
Mark Neary / BSB – email
Eric Hassler / BSB – email
Julia Crain / BSB – email
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BPSOU SharePoint – upload

SILVER BOW CREEK/BUTTE AREA NPL SITE
BUTTE PRIORITY SOILS OPERABLE UNIT

Final

2023 Residential Metals Abatement Program (RMAP)
Copper/Emmett Park
Soil Remedial Action Work Plan (RAWP)

Butte-Silver Bow County

and

Atlantic Richfield Company

June 29, 2023

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8, MONTANA OFFICE
FEDERAL BUILDING, 10 West 15TH Street, Suite 3200
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www.epa.gov/region8

Ref: 8MO

June 13, 2023

Mr. Mike McAnulty
Liability Manager
Atlantic Richfield Company
317 Anaconda Road
Butte, Montana 59701

Re: Approval letter for the Butte Priority Soils Operable Unit (BPSOU) 2023 Residential Metals Abatement Program Copper/Emmett Park Soil Remedial Action Work Plan (RAWP) (dated May 17, 2023)

Dear Mike:

The U. S. Environmental Protection Agency (EPA), in consultation with the Montana Department of Environmental Quality (DEQ), is approving the *Butte Priority Soils Operable Unit (BPSOU) 2023 Residential Metals Abatement Program Copper/Emmett Park Soil Remedial Action Work Plan (RAWP) (dated May 17, 2023).* Please incorporate the following comments and distribute this RAWP submittal as final.

- Section 4.4: The conveyance rate calculation brief states that calculations were not based on an estimated flow rate from the artesian feature but rather the flow rates of the piping/trench. Please confirm the design flow rates are adequate for actual conditions. In addition, see comment below on Figure 7 and the details.

  BSB/Atlantic Richfield Company Response (06/29/23) – Text has been added to further clarify the available data regarding the trench flow rate, and the design assumptions used to ensure conservatively high conveyance infrastructure is included in the design. Changes to the design between Draft Final and Final submittal packages include adjustments to the drainage infrastructure to remove potential flow bottlenecks, include maintenance cleanouts, and ensure design flow rates are well above expected capture flow.

- Figure 1: The callout on the northern portion of the lot stating that the area where neighbors are parking will be removed and resodded. Please confirm controls there will be implemented to ensure the remedy will not be impacted.

  BSB/Atlantic Richfield Company Response (06/29/23) – At owner request, the area where neighbors are parking will be remediated and surfaced with sod. It will be up to the owner to decide upon proper site controls to protect the remedy.

- Figure 5: Please consider a valve box or shallow manhole for future maintenance/potential cleanout at the 3-way pipe junction north of the playground equipment area.

BSB/Atlantic Richfield Company Response (06/29/23) – A cleanout structure has been added to address comment.

- Figure 7, Detail 5, 6, 7, 8: Due to times of the year when 4-inch perforated lines feeding the conveyance are running at high flows, please consider daylighting the new 4-inch conveyance line directly into the stormwater collection feature rather than tying this line into the existing 4 inch line coming from the west along the boulevard. These modifications may require additional appurtenances to the existing design as shown on Details 7 and 8 as well as additional coordination with BSB.

  BSB/Atlantic Richfield Company Response (06/29/23) – Upon further site investigations which included Agency representation, a revised drain system has been proposed to address this Agency comment. Rather than daylight the new 4-inch conveyance line into the existing stormwater collection feature, the new drain will tie into the existing drain which parallels Copper Street (as originally proposed). However, the section of pipe between this wye junction and the existing stormwater collection feature has been upsized from a 4" diameter pipe to a 6" diameter pipe to address this Agency comment.

- Figure 7, Detail 5 6, & Attachment C. Please consider using an HDPE Geonet product in lieu of the proposed geotextile to minimize eventual silt collection and fabric blinding.

  BSB/Atlantic Richfield Company Response (06/29/23) – Trench liner material has been changed in response to this comment and concerns over long-term fabric blinding. A lightweight polypropylene geogrid, slightly more malleable than typical geonets but with similar stabilization properties, will be used to stabilize the trench while minimizing silt accumulation over time.

If you have any questions or concerns, please call me at (406) 457-5019.

Sincerely,

NIKIA GREENE

Digitally signed by NIKIA GREENE
Date: 2023.06.13 10:40:30 -06'00'

Nikia Greene
Remedial Project Manager

cc: (email only)
Butte File
Daryl Reed; DEQ
Jon Morgan; DEQ counsel
Carolina Balliew; DEQ
Harley Harris; NRDP
Katherine Hausrath; NRDP
Jim Ford; NRDP
Pat Cunneen; NRDP
John Gallagher; BSBC
Sean Peterson; BSBC

Eileen Joyce; BSBC
Eric Hassler; BSBC
Brandon Warner; BSBC
Chad Anderson; BSBC
Karen Maloughney; BSBC
Julia Crain; BSBC
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Robert Lowry, BNSF counsel
Loren Burmeister; AR
Josh Bryson; AR
Chris Greco; AR
Mike Mcanulty; AR
Dave Griffis; AR
Jean Martin; Counsel AR
Mave Gasaway; attorney for AR
Adam Cohen; Counsel for AR
Pat Sampson; Pioneer for AR
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Scott Bradshaw; TREC
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SILVER BOW CREEK/BUTTE AREA NPL SITE
BUTTE PRIORITY SOILS OPERABLE UNIT

Final

2023 Residential Metals Abatement Program (RMAP)
Copper/Emmett Park
Soil Remedial Action Work Plan (RAWP)

Prepared for:

Butte-Silver Bow County
Superfund Division
155 W. Granite
Butte, Montana 59701

and

Atlantic Richfield Company
317 Anaconda Road
Butte, Montana 59701

Prepared by:

Pioneer Technical Services, Inc.
1101 S. Montana Street
Butte, Montana 59701

June 29, 2023

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DOCUMENT MODIFICATION SUMMARY

Modification	Author	Version	Description	Date
0	Jesse Schwarzrock	Draft	Issued for Internal Review	05/15/23
0	Jesse Schwarzrock	Draft Final	Issued for Agency Review	05/17/23
0	Jesse Schwarzrock	Final	Issued Final to Agencies	06/29/23

1.0 INTRODUCTION

This Remedial Action Work Plan (RAWP) outlines a portion of the remedial action (RA) work resulting from the 2022 Residential Metals Abatement Program (RMAP) park soil sampling event that began in June 2022 and concluded in November 2022. The sampling event was conducted according to the *Final 2022 Residential Metals Abatement Program (RMAP) Quality Assurance Project Plan (QAPP) (Non-Residential Parcels)* (Butte-Silver Bow County and Atlantic Richfield Company, 2022a) and the *Final 2022 Residential Metals Abatement Program (RMAP) Park Soil Sampling Field Sampling Plan (FSP) Submittal #2 [Covering Scown Field, Cherokee Park, Copper/Emmett, West Side Subdivision Park, Chester Steele Park, and Cinders Field] (*Butte-Silver Bow County and Atlantic Richfield Company, 2022b).

2.0 PARK SOIL REMEDIATION SCOPE

The scope of work covered by this RAWP includes the following park(s):

- Copper/Emmett Park (see Table 1).

3.0 PARK SOIL REMEDIATION SCHEDULE

Remedial activities will be completed during the 2023 construction season. Relevant stakeholders will review all scheduling decisions to ensure minimal disturbance to the public.

4.0 COPPER/EMMETT PARK REMEDIAL ACTION WORK PLAN

Remediation at Copper/Emmett Park consists of one polygon totaling approximately 0.45 acre. The remedial polygon, Incremental Sampling Method (ISM) Area 1 (IS-1), represents the entire park footprint with the exception of the playground area which is a no action area:

- Polygon IS-1 (19,719 square feet).

The remedial polygon is irrigated and has a well-maintained grass cover (see Figure 1). The Individual Site Work Plan (ISWP) is provided in Attachment A.

4.1 Excavation

The IS-1 polygon (IS-1) has lead exceedances to a depth of 12 inches. As previously stated, this polygon has a well-established grass cover. Based on this information, the removal area will be dictated by the original sampling polygon areas with the RMAP maximum removal depth of 14 inches below the existing sod mat (see Figure 2 and Figure 3).

A 1-foot mandatory buffer will be maintained around all existing utilities. If achieving the removal depth means encroaching within the 1-foot mandatory utility buffer, excavation work will stop at the 1-foot-from-utility mark. No removal work will take place within 1 foot of existing utilities. As mandated by Atlantic Richfield Company's (Atlantic Richfield's)

Remediation Management – Control of Work Defined Practices[1], mechanical excavation is not allowed within 2 feet of existing utilities. Therefore, any excavation work within 2 feet of the utility will be excavated by hand. The excavation depth will be measured from below the existing sod mat, where applicable.

All excavated material will be disposed of within the Butte Mine Waste Repository (see Figure 4). Crews will verify the depth of the excavation area using a hand tape for measurement and using existing perimeter features (i.e., the elevation of the concrete curbing/tree areas/native soil around the excavation perimeter).

Care will be taken to protect existing concrete paving and curbing in and around the work area. If any of this existing infrastructure is damaged, it will be replaced/repaired.

If excavations are not able to be backfilled during the same shift that they were developed, Site control measures will be implemented during non-working hours. This may include perimeter control via safety cones and caution tape, construction fencing, or other approved methods.

4.2 Backfill

Once the on-Site Environmental Protection Agency (EPA) representative approves the excavation area, backfill work will begin (see Details 1 and 2 on Figure 2). A 2-inch-thick layer of sugar beet lime (see Section 5.1, Attachment B, and Attachment B-1) will be placed at the bottom of the excavation in case there are pH issues in underlying native soil.

Once the lime layer is in place, a separation fabric (see Section 5.2 and Attachment C) will be placed, consistent with current RMAP practices. The separation fabric will indicate the boundary between remediated and native soil for any future excavation work in this area.

Once the separation fabric is installed, 12 inches of Type A growth medium (see Section 5.3, Attachment D, Attachment D-1, and Attachment D-2) will be placed within polygon IS-1. Backfill materials will not be compacted to attain a specific density and moisture content but will be slightly compacted to impede future settling of the backfill material.

4.3 Revegetation

Within IS-1, sod placement will be the most appropriate option given the maintained, irrigated nature of the property. Sod procurement is detailed in Section 5.4. All previously sodded areas disturbed during construction will receive sod. After final grading of backfill areas is complete, areas to be sodded will be raked or otherwise cleared of stones larger than 1 inch in diameter, sticks, stumps, and other debris, which might interfere with sodding, growth of grass, or subsequent maintenance of grass-covered areas.

[1] This document is an Atlantic Richfield Company internal document.

4.4 Artesian Area

In the northern portion of IS-1, saturated surface soil and wetland-type vegetation indicate the presence of artesian groundwater. Artesian groundwater was also noted on the adjacent property to the west, where a drain system was installed in 2007 to transmit the groundwater away from the structure. The source of the groundwater, groundwater chemistry, and approximate flow rate to the surface are not known at this time. During field visits, groundwater has not been observed to surface in any great quantity or flow off Site, and the existing drain from the adjacent property did not appear to flow into the manhole at greater than 0 to 20 gallons per minute at the time of the field visits. Instead of developing the spring on Site and collecting more data to determine a likely flow regime, the conservative design described here includes conveyance features capable of conveying much higher flow than the anticipated spring flow rates.

To safely complete the RA and protect the remediated soil from potentially impacted groundwater, surfacing groundwater will be routed away from the artesian area via a French drain system. The plan view of the trench and drain alignments are provided on Figure 5, and elevation profiles of the piping are shown on Figure 6. The French drain will consist of two runs of 4-inch perforated standard dimension ration (SDR) 35 polyvinyl chloride (PVC) pipe installed in a gravel trench. Vertically perforated PVC pipe such as A-2000 (Contech) is also acceptable.

The drain trench will be a minimum of 18 inches wide and excavated to a minimum depth of 42 inches from the final grade. The perforated pipe will be placed on 6 inches of ¾-inch washed gravel and covered with ¾-inch washed gravel to the removal surface, typically up to 40 inches. The 40 inches of washed gravel will provide a frost break and allow easy conveyance of groundwater into the perforated pipe with minimal risk of frost heave. The trench will be lined with Tenax LBO 202 biaxial polypropylene geogrid material (see Section 5.5 and Attachment E) prior to placement of the gravel. The porous, light weight geogrid will help stabilize the trench without fine material ‘blinding off’ the liner fabric over time. Lime, separation fabric, cover soil, and sod will be placed above the gravel per the typical specifications described above. A typical cross section of the trench and drain is provided on Figure 7.

The perforated PVC pipe runs will originate from a point downgradient of the artesian area, on the northern boundary of the PA-1 area (Figure 5). One run, extending to the northeast, will capture any artesian or near surface groundwater in the eastern part of the artesian area, while the other run will extend west to capture and transmit groundwater from the western side of the artesian area. The perforated pipe and trench will be installed at a grade of 5.7% on the western alignment, following the existing slope with minimal regrading, and 10.5% on the eastern alignment. The contractor will grade the Site to ensure positive drainage into the drain alignment from the north.

Each run of the drain will wye into the solid conveyance pipe at the topographic low point on the north boundary of the playground area and enter a single 4-inch solid SDR 35 PVC pipe. The solid pipe will convey the captured groundwater to the existing 4” PVC drain line running along the Copper Street boulevard, and on to the Butte-Silver Bow storm water vault on the northwest corner of the intersection of Copper Street and Emmet Avenue. The upper end of the pipe will surface into an irrigation box, where the cap may be removed for pipe cleanout maintenance. The

pipe bottom will enter the existing pipe in a 6” 45-degree wye fitting. Reducing couplings will be added to the contributing pipes above the wye fitting to expand each drainpipe from 4” diameter to 6” diameter. Downstream of the wye, the existing 4” drainpipe to the vault will be removed and replaced with a 6” SDR 35 PVC pipe, and refit to the vault outlet. Sidewalk and curb will be removed and replaced to facilitate the manhole tie-in of the new 6” pipe, as required. Typical PVC wye construction and cleanout construction details are included on Figure 7.

Required trench depth to maintain a grade of 9.5% in the solid PVC drainpipe running from the perforated pipes to the wye into the existing pipe ranges from approximately 16 inches depth at the wye up to 60 inches from the existing surface, in some locations. Design conveyance rates of the French drain and solid PVC pipe are expected to exceed the likely quantity of groundwater by a safe margin. Conveyance calculations are provided in Attachment F.

During construction, it is expected that excavation of the trench alignments will require some amount of dewatering. The contractor will be responsible for capturing and conveying groundwater out of the excavation for safe and effective construction of the French drain system. Groundwater pumped out of the excavation will be treated for turbidity before being routed into the storm water drain for disposal. Any required pumps, containment, treatment, and conveyance infrastructure will be the responsibility of the contractor.

4.5 Dust Control

This work will be performed within a residential area; consequently, controlling fugitive dust emissions is a high priority. If fugitive dust emissions become significant during the work, all work will be shut down until alternative and satisfactory dust control methods are determined. The contractor will be responsible for acquiring water for dust control from a source of the contractor’s choice.

4.6 Best Management Practices

Best management practices (BMPs) will be installed, as necessary, to ensure sediment does not leave the work area.

5.0 MATERIALS

The following sections describe the materials that will be used in completion of the above described RA, including lime, geotextile fabric, growth medium, and sod.

5.1 Sugar Beet Lime Source

Western Sugar Cooperative in Billings, Montana, is providing the sugar beet lime. This material was hauled from Billings to Atlantic Richfield property in Butte in August and September 2022 (see stockpile location on Figure 8) in case RA construction activities started late in 2022. Trucks were diverted to Butte from an existing haul to the Anaconda Smelter National Priorities List Site. Internal quality assurance data from the two months preceding delivery to Butte are provided in Attachment B. The corresponding laboratory reports are in Attachment B-1.

5.2 Fabric Materials

WinFab 1000NE non-woven geotextile fabric (or equivalent) will be used for the separation fabric to provide a barrier between the growth medium and native soil. The same fabric will also be as a weed barrier beneath the rubber chip surface cover material in PA-1. The material specifications are in Attachment C.

5.3 Growth Medium Borrow Source

The Racetrack borrow stockpile will be used for all required backfill material within IS-1 (the stockpile location is shown on Figure 9). The Agency-approved quality assurance data are provided in Attachment D, and the corresponding laboratory reports are located in Attachment D-1 and Attachment D-2.

5.4 Sod

Kentucky bluegrass sod will be procured from Summit Valley Turf in Whitehall, Montana.

5.5 Geogrid Material

In the subsurface drain capture trench, a lightweight biaxial geogrid material will be used (Tenax LBO 202 Type 1 biaxial geogrid, or equivalent) to stabilize the trench while providing large grid apertures to prevent fine material 'blinding off' of the gravel over time. The material specifications are in Attachment E.

6.0 REFERENCES

Butte-Silver Bow County and Atlantic Richfield Company, 2022a. Final 2022 Residential Metals Abatement Program (RMAP) Quality Assurance Project Plan (QAPP) (Non-Residential Parcels). Silver Bow Creek/Butte Area NPL Site Butte Priority Soils Operable Unit. June 21, 2022.

Butte-Silver Bow County and Atlantic Richfield Company, 2022b. Final 2022 Residential Metals Abatement Program (RMAP) Park Soil Sampling Field Sampling Plan (FSP) Submittal #2 [Covering Scown Field, Cherokee Park, Copper/Emmett, West Side Subdivision Park, Chester Steele Park, and Cinders Field]. Silver Bow Creek/Butte Area NPL Site Butte Priority Soils Operable Unit. June 21, 2022.

Figures

NOTES:

1. IS1 WILL BE REMEDIATED PER DETAIL 1 ON FIGURE 2.

2. WORK AROUND UTILITIES/UTILITY CORRIDORS WILL BE IN ACCORDANCE WITH BP'S CURRENT GROUND DISTURBANCE POLICY.

LEGEND

- No Action Required
- 14" Removal
- 26" Removal
- Non-Samplable Area
- No Work Area

N

DISPLAYED AS:
PROJECTION/ZONE: MSP
DATUM: NAD 83
UNITS: FEET
SOURCE: PIONEER

0 15 30 60
Feet

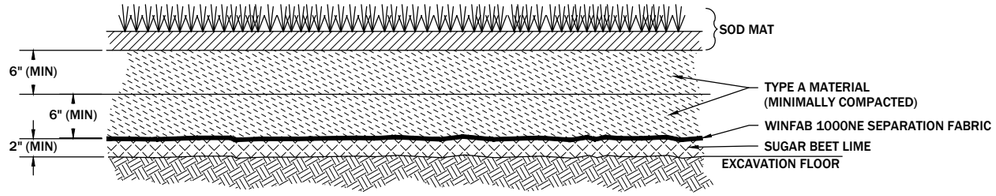
FIGURE 1

PIONEER TECHNICAL SERVICES, INC.

P-0009
COPPER/EMMETT
SITE OVERVIEW

DATE: 6/19/2023

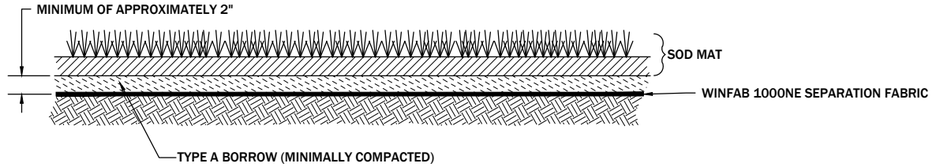
Path: Z:\Shared\Active Projects\ARCO\BPSOU\RMAP\GIS\Parks\Park RAWP Figures\CopperEmmet\RAWP_CopperEmmet1.mxd



14" SOIL AND SOD REMOVAL/REPLACEMENT DETAIL

1

NOTE: 14" OF NATIVE SOIL TO BE REMOVED. IT WILL BE REPLACED WITH 2" OF LIME, A SEPARATION FABRIC, AND 12" OF TYPE A KAW AVENUE STOCKPILE GROWTH MEDIUM.



TREE CANOPY REMOVAL/REPLACEMENT DETAIL

2

NOTE: A FULL 14" OF REMOVAL WILL BE ATTEMPTED WITHIN TREE CANOPIES, BUT WILL NOT BE FEASIBLE IN ALL AREAS DUE TO TREE ROOTS. IN THESE AREAS, A MINIMUM REMOVAL OF THE EXISTING COVER MATERIAL (SOD/AGGREGATE) PLUS 2" OF NATIVE MATERIAL WILL BE ATTEMPTED. IN THIS SCENARIO, NO LIME WILL BE PLACED. A SEPARATION FABRIC, 2" OF KAW AVENUE STOCKPILE GROWTH MEDIUM, AND WOOD CHIPS/LANDSCAPING MATERIAL CHOSEN BY THE OWNER WILL BE PLACED TO BACKFILL THE EXCAVATION AREA.

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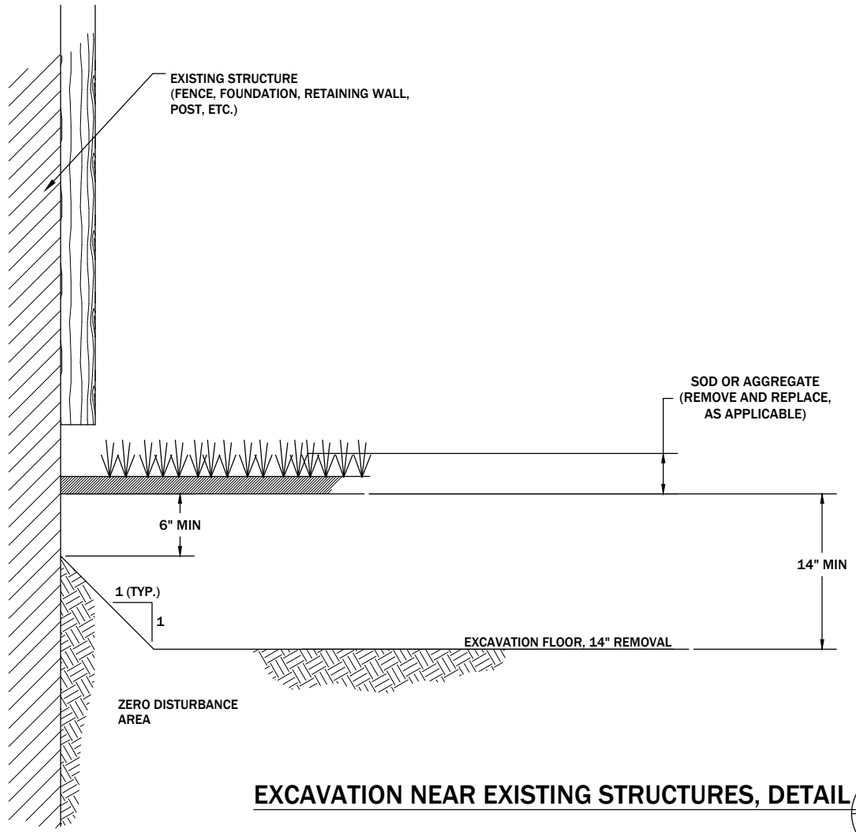
FIGURE 2

PIONEER TECHNICAL SERVICES, INC.

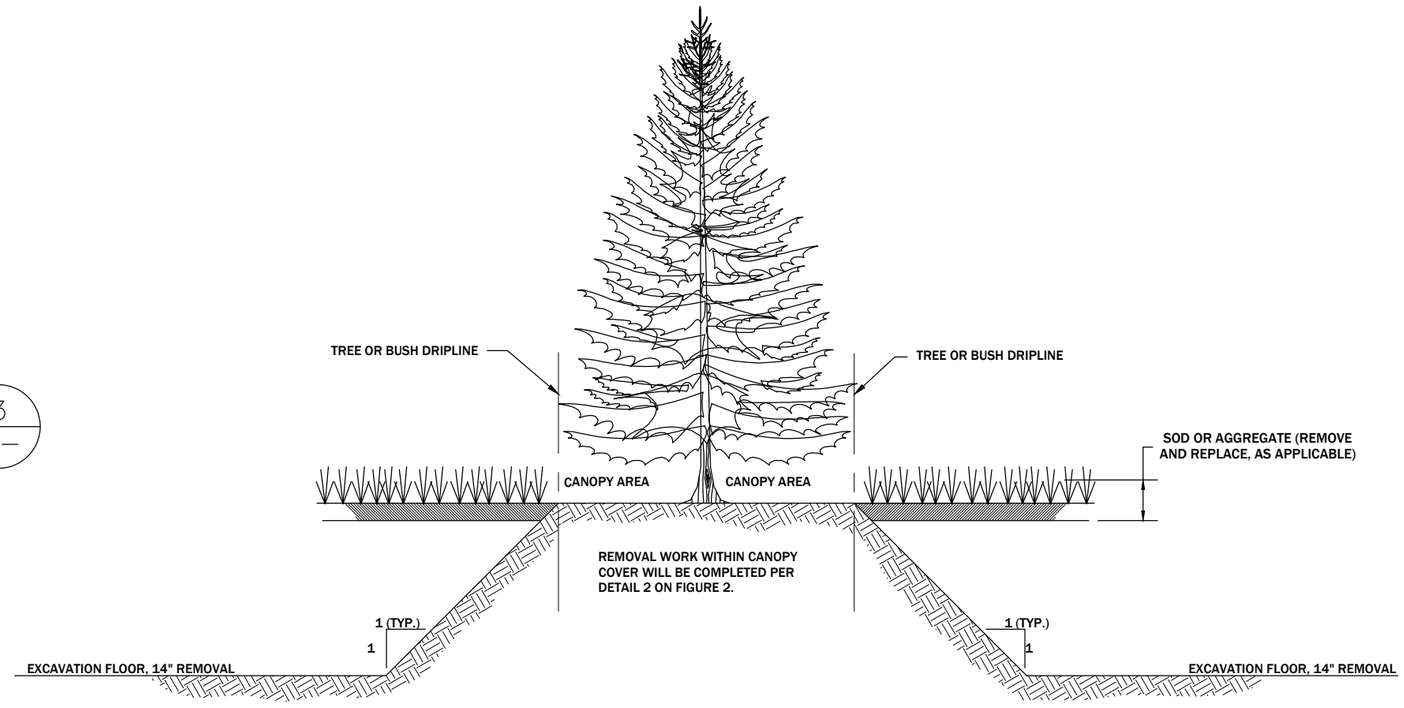
REMOVAL CROSS SECTIONS

DATE: 6/19/2023

6/19/2023 10:43:10 AM Z:\SHARED\ACTIVE PROJECTS\ARCO\BPSOU\RMAP\GIS\PARKS\PARK RAWP FIGURES\COPPEREMMET\RAWP_COPPEREMMET2.DWG



EXCAVATION NEAR EXISTING STRUCTURES, DETAIL 3



EXCAVATION NEAR EXISTING TREES, BUSHES, AND SHRUBS, DETAIL 4

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COORD SYS/ZONE:
DATUM:
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FIGURE 3

REMOVAL DETAILS

PIONEER TECHNICAL SERVICES, INC.

DATE: 6/19/2023

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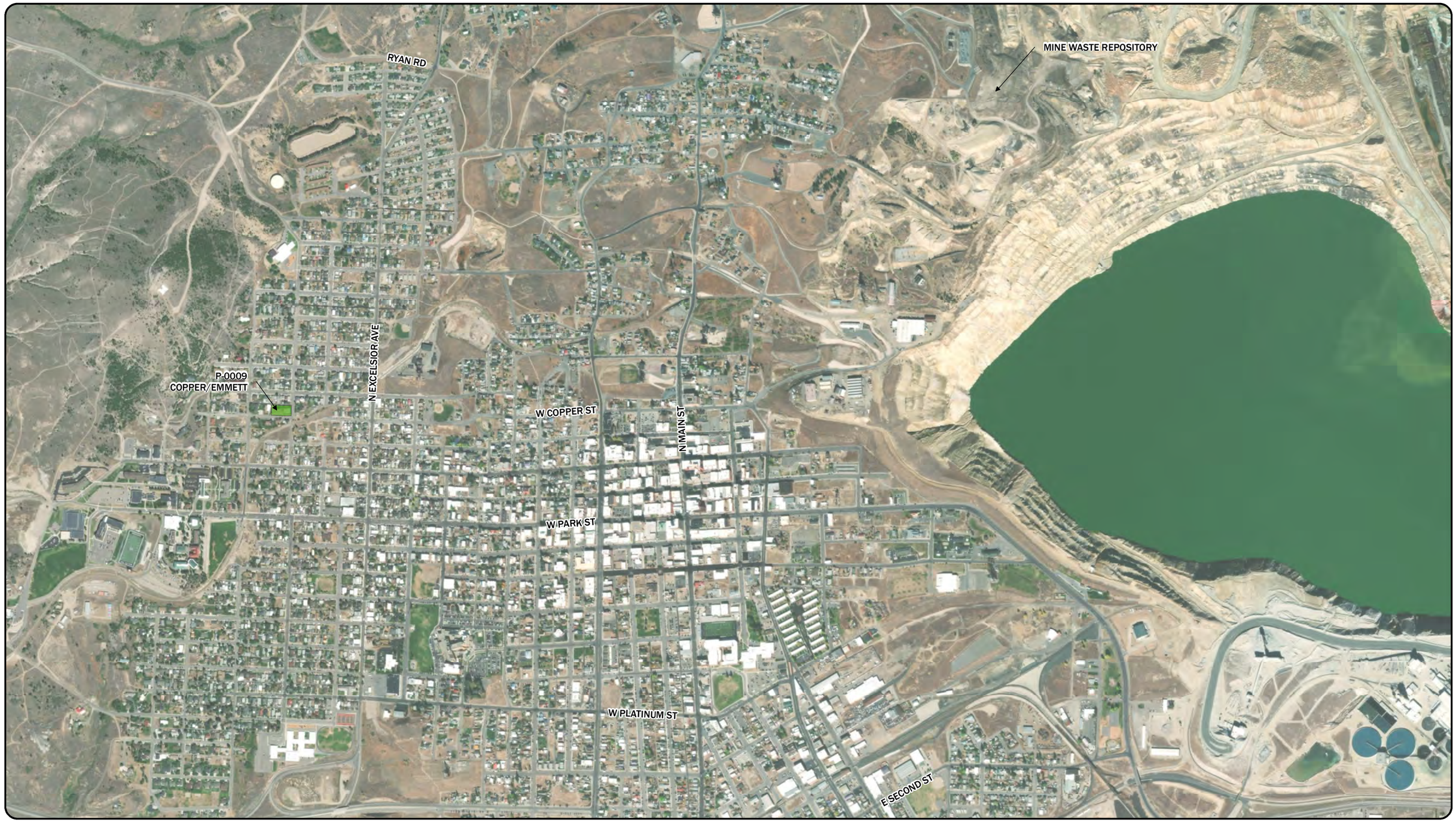

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PROJECTION/ZONE: MSP
DATUM: NAD 83
UNITS: FEET
SOURCE: PIONEER

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Feet

FIGURE 4

MINE WASTE REPOSITORY LOCATION

PIONEER TECHNICAL SERVICES, INC.

DATE: 6/19/2023

Path: Z:\Shared\Active Projects\ARCO\BPSOU\RMAP\GIS\Parks\Park RAWP Figures\CopperEmmet\RAWP_CopperEmmet4.mxd

LEGEND:

- EXISTING DRAIN PIPE
- PERFORATED DRAIN PIPE
- DRAIN PIPE
- SITE BOUNDARY
- PLAYGROUND BOUNDARY
- EXISTING SURFACE 2' CONTOURS

CONTRACTOR WILL GRADE THE AREAS NORTH OF DRAINS TO ENSURE POSITIVE SLOPE TOWARDS DRAIN ALIGNMENTS.

CLEANOUT, SEE DETAIL 3/7

0+00

BURIED 4" SDR 35 PVC PERFORATED DRAIN PIPE IN GRAVEL TRENCH, SEE DETAIL 1/7

0+00

0+25

0+41

22.5° ELBOW

45° WYE, SEE DETAIL 4/7

45° WYE, SEE DETAIL 4/7

BURIED 4" SDR 35 PVC PERFORATED DRAIN PIPE IN GRAVEL TRENCH, SEE DETAIL 1/7

5790

5780

BURIED 4" SDR 35 PVC SOLID CONVEYANCE PIPE, SEE DETAIL 2/7

REMOVE AND REPLACE SIDEWALK AND CURB, AS APPROPRIATE TO INSTALL TRENCH

22.5° ELBOW COUPLING

1+86

EXISTING 4" PVC DRAIN PIPE

6" 45° WYE INTO EXISTING DRAIN LINE, ADD 4" TO 6" REDUCING COUPLINGS UPGRADIENT OF WYE ON EACH PIPE. SEE DETAIL 5/7

APPROXIMATE LOCATION OF EXISTING BUTTE-SILVER BOW STORMWATER COLLECTION VAULT.

REMOVE AND REPLACE EXISTING 4" DRAIN LINE INTO MANHOLE WITH 6" SDR 35

N

DISPLAYED AS:
COORD SYS/ZONE: MSP
DATUM: NAD 83
UNITS: INT FEET
SOURCE: PIONEER

SCALE IN FEET
0 10 20

FIGURE 5

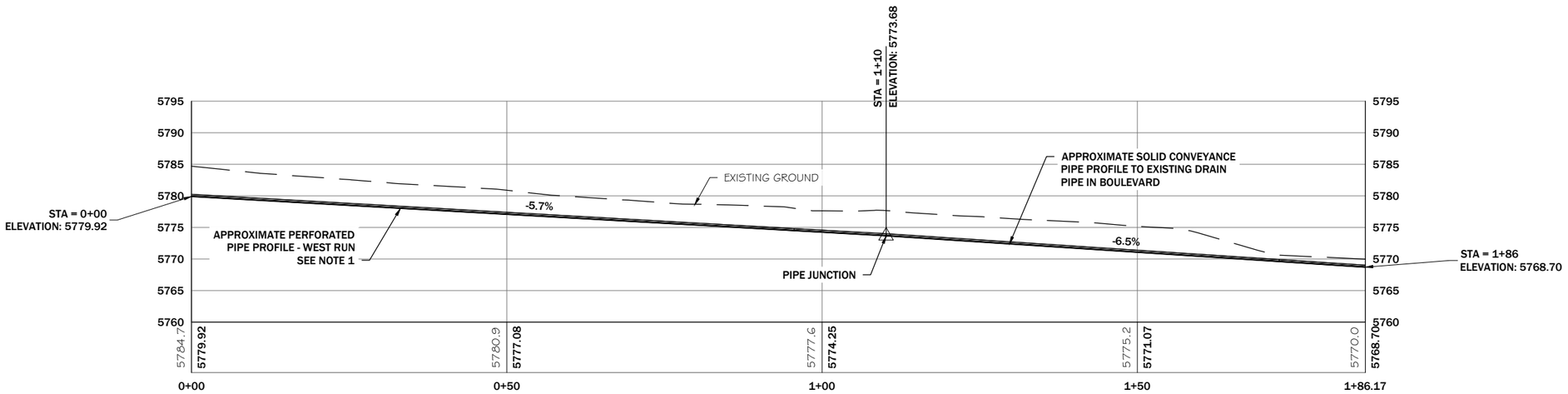
ARTESIAN AREA DRAIN SYSTEM PLAN VIEW

PIONEER TECHNICAL SERVICES, INC.
307 E. PARK AVE., SUITE 421
ANACONDA, MONTANA 59711
(406) 563-9371

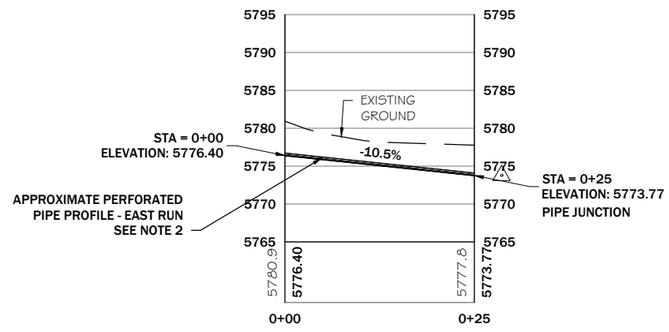
DATE: 6/23/2023

NOTE:

1. CONTRACTOR WILL PERFORM SURFACE GRADING TO ENSURE BURIAL DEPTH OF 42" TO PIPE CENTER FROM FINAL SURFACE. PIPE WILL MAINTAIN AVERAGE GRADE OF 5.7%.
2. CONTRACTOR WILL PERFORM SURFACE GRADING TO ENSURE BURIAL DEPTH OF 42" TO PIPE CENTER FROM FINAL SURFACE. PIPE WILL MAINTAIN AVERAGE GRADE OF 10.5%.
3. ALL ELEVATIONS ARE GIVEN IN FEET, IN NAVD 88.



PROFILE 1



PROFILE 2

DISPLAYED AS:
COORD SYS/ZONE: MSP
DATUM: NAD 83
UNITS: INT FEET
SOURCE: PIONEER

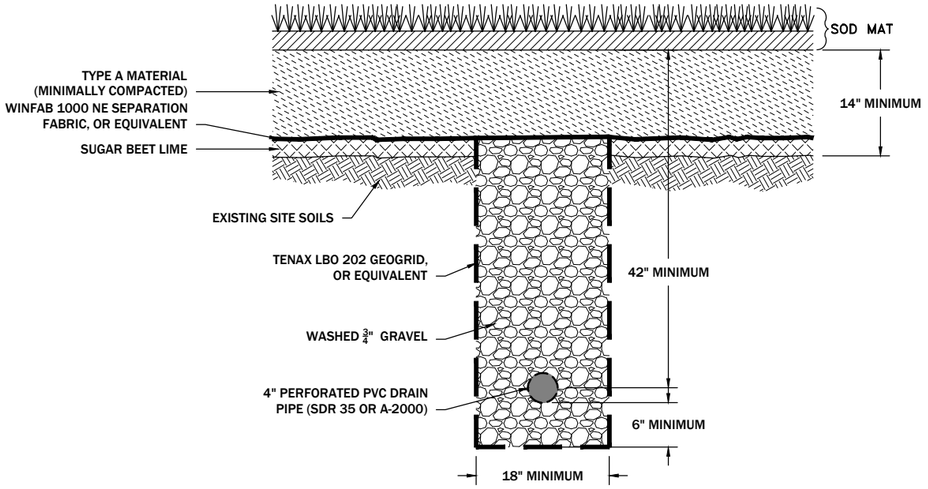
SCALE IN FEET
0 10 20

FIGURE 6

DRAIN ELEVATION PROFILE VIEW

PIONEER TECHNICAL SERVICES, INC.
307 E. PARK AVE., SUITE 421
ANACONDA, MONTANA 59711
(406) 563-9371

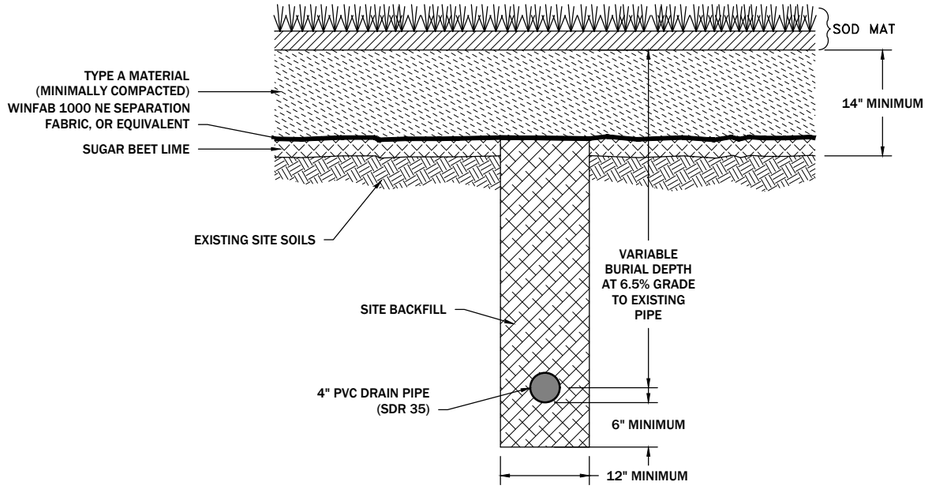
DATE: 6/23/2023



PERFORATED SDR 35 PVC DRAIN PIPE TRENCH TYPICAL CROSS SECTION

1

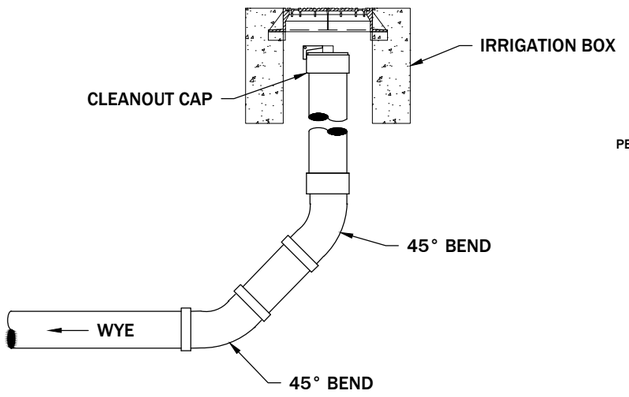
NTS



SOLID SDR 35 PVC CONVEYANCE PIPE TRENCH TYPICAL CROSS SECTION

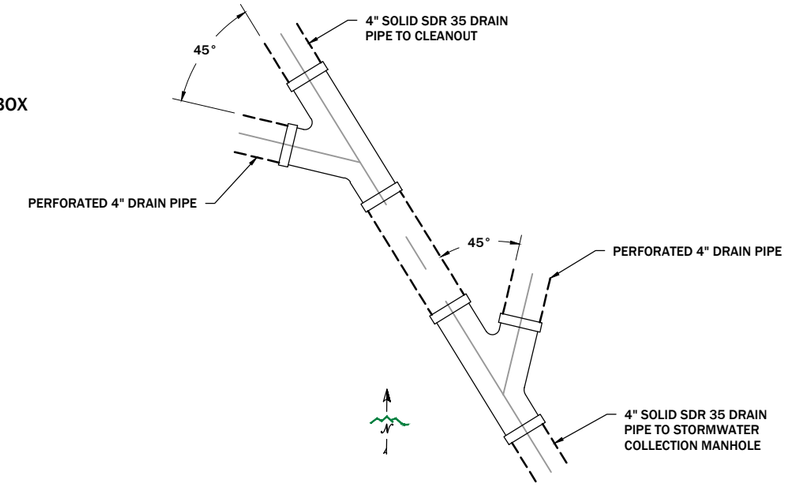
2

NTS



CLEANOUT DETAIL

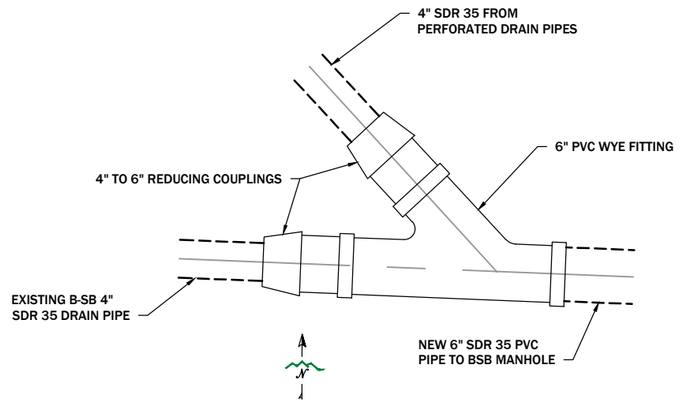
3



PVC WYE DETAIL

4

NOTE: CONTRACTOR IS RESPONSIBLE FOR JOINING PIPE WITH APPROPRIATE FITTINGS (WYES, ELBOWS OR OTHER CONNECTORS) TO MAINTAIN DRAIN PIPE ALIGNMENTS AND ELEVATIONS AS DESIGNED



PVC WYE WITH REDUCING COUPLINGS DETAIL

5

DISPLAYED AS:

COORD SYS/ZONE: NA

DATUM: NA

UNITS: NA

SOURCE: PIONEER

SCALE IN FEET

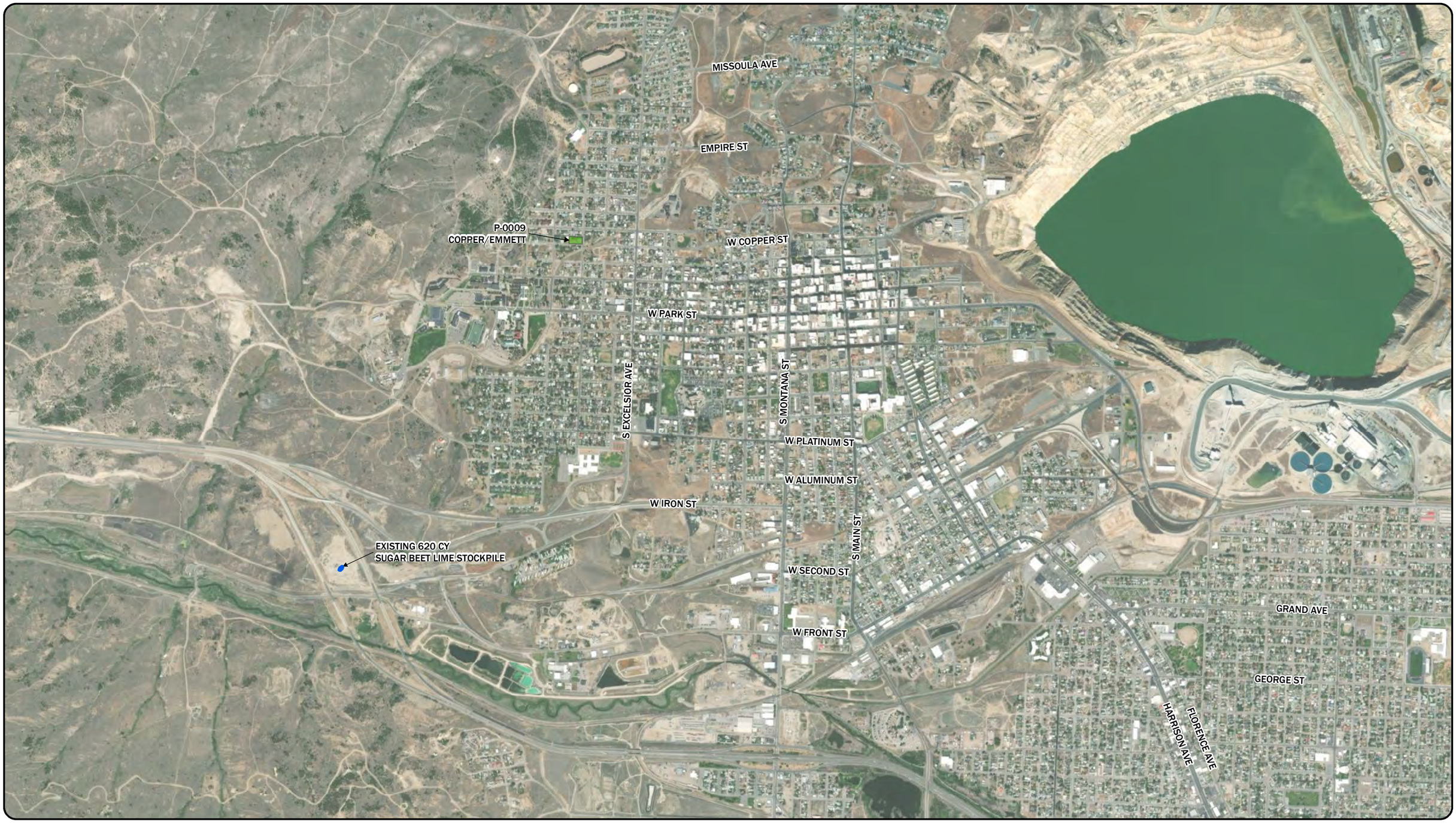
0 NTS NTS

FIGURE 7

DRAIN SYSTEM DETAILS

PIONEER TECHNICAL SERVICES, INC.
307 E. PARK AVE., SUITE 421
ANACONDA, MONTANA 59711
(406) 563-9371

DATE: 6/23/2023



N

DISPLAYED AS:
PROJECTION/ZONE: MSP
DATUM: NAD 83
UNITS: FEET
SOURCE: PIONEER

0 750 1,500 3,000
Feet

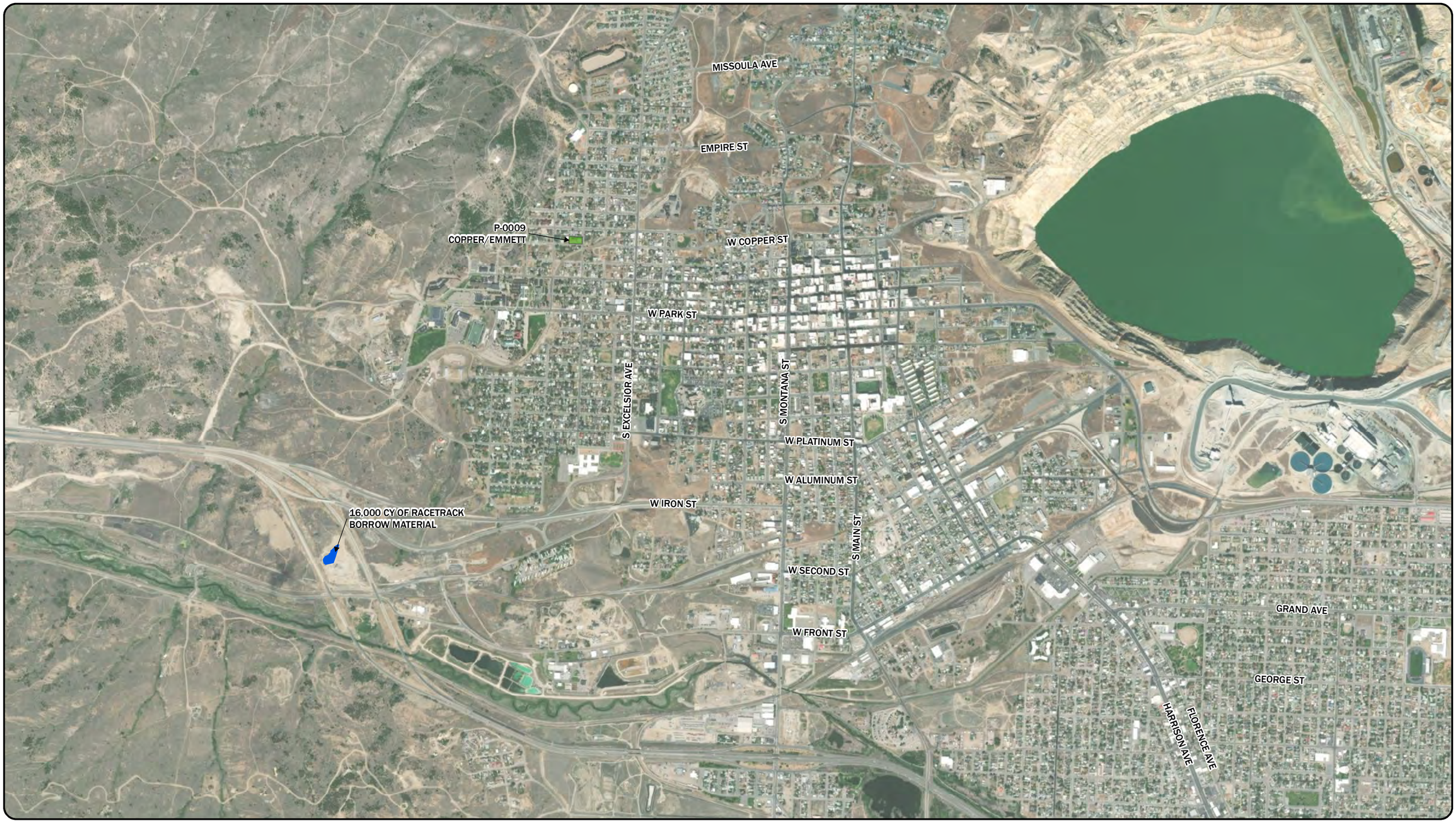
FIGURE 8

SUGAR BEET LIME STOCKPILE LOCATION

PIONEER TECHNICAL SERVICES, INC.

DATE: 6/19/2023

Path: Z:\Shared\Active Projects\ARCO\BPSOU\RMAP\GIS\Parks\Park RAWP Figures\CopperEmmet\RAWP_CopperEmmet8.mxd



N

DISPLAYED AS:
PROJECTION/ZONE: MSP
DATUM: NAD 83
UNITS: FEET
SOURCE: PIONEER

0 750 1,500 3,000
Feet

FIGURE 9

RACETRACK BORROW STOCKPILE LOCATION

PIONEER TECHNICAL SERVICES, INC.

DATE: 6/19/2023

Path: Z:\Shared\Active Projects\ARCO\BPSOU\RMAP\GIS\Parks\Park RAWP Figures\CopperEmmet\RAWP_CopperEmmet9.mxd

Tables

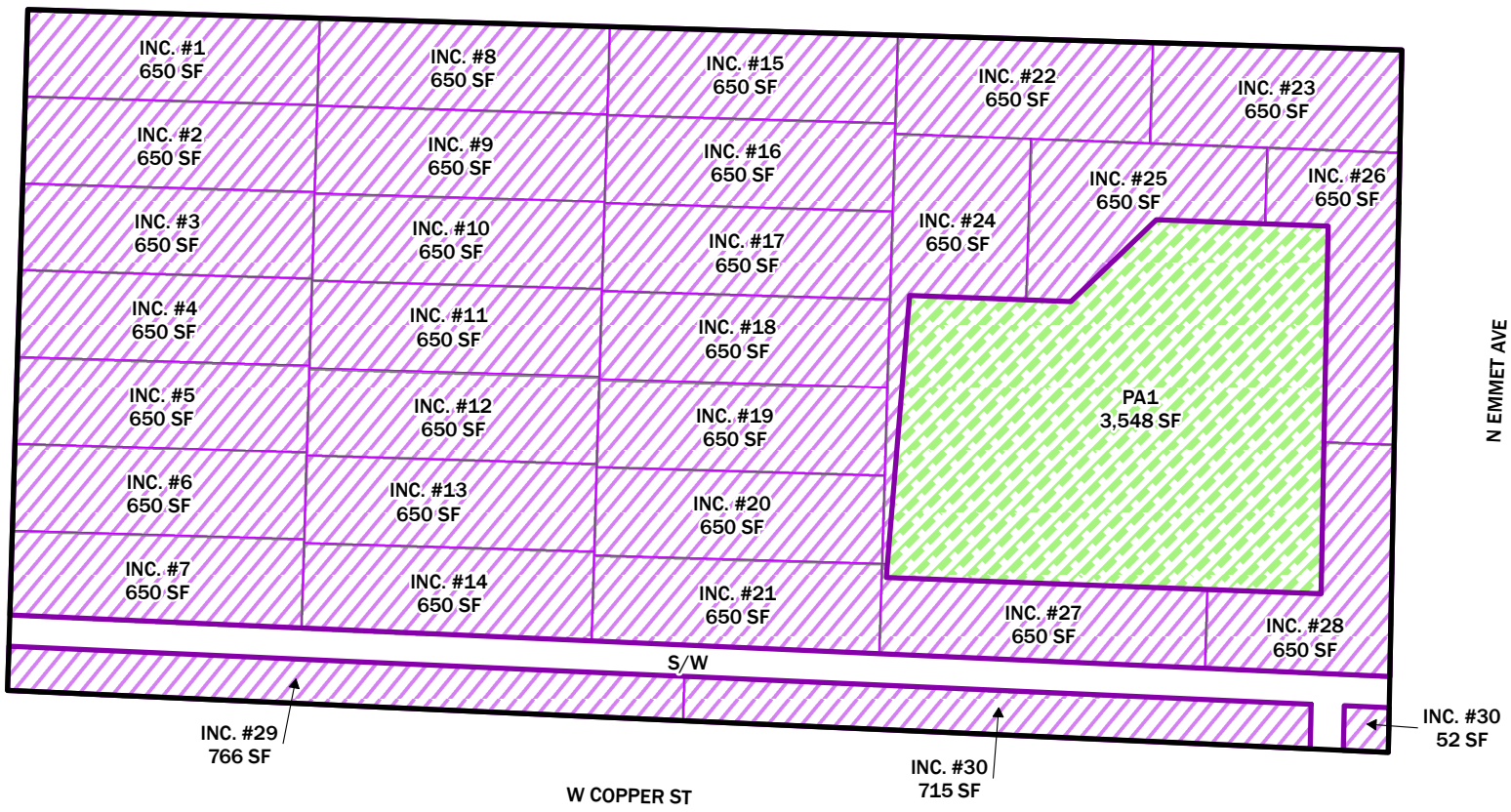
Table 1. Copper Emmett Park Property Information

TABLE 1: COPPER/EMMETT PARK PROPERTY INFORMATION

Count	Res-ID	Geocode	Name	Owner
1	P-0009	01119714134150000	Copper Emmett Park	Butte Silver Bow

Attachment A
Draft Copper Emmett Park
Individual Site Work Plan

GEOCODE: 01119714134150000
PROPERTY ID: P-0009



P-0009

LEGEND

- No Action Required
- 14" Removal
- 26" Removal
- Un-Samplable Area

COPPER/EMMETT
INDIVIDUAL SITE WORK PLAN

RESIDENTIAL METALS
ABATEMENT PROGRAM (RMAP)

BUTTE, MONTANA
SHEET 1 OF 2

NOTES:

1. LOOK ON BACK OF SHEET FOR DATA TABLE.

Boundaries on this site work plan DO NOT represent a legal survey. These boundaries are to be used for general reference only. No liability is assumed by Atlantic Richfield Company or Pioneer Technical Services for the accuracy of these.

DRAFT
DATA VALIDATION NOT YET COMPLETE

N

30 15 0 30 Feet

Atlantic Richfield Company
A BP affiliated company

BY: PIONEER TECHNICAL SERVICES, INC.

Date: 7/21/2022
Revision#: 0
File Name: RMAP_ISWP_CopperEmmet

REMEDIAL ACTION SUMMARY TABLE

COMPOSITE SAMPLING DATA SUMMARY

Resident ID	SAMPLING COMPONENTS	COMPONENT SURFACE AREA (Square Feet)	COMPOSITE ARSENIC CONCENTRATION (mg/kg)					COMPOSITE LEAD CONCENTRATION (mg/kg)					COMPOSITE MERCURY CONCENTRATION (mg/kg)				
P-0009			0-2"	2-6"	6-12"	12-18"	18-24"	0-2"	2-6"	6-12"	12-18"	18-24"	0-2"	2-6"	6-12"	12-18"	18-24"
P-0009-PA1	Playground Area 1 (PA1)	3,548	7	10	31	N/A	N/A	12	17	319	N/A	N/A	0.01	0.01	0.10	N/A	N/A
P-0009-PA1-D-3	Play Area 1 (PA1) Duplicate	-	N/A	N/A	33	N/A	N/A	N/A	N/A	385	N/A	N/A	N/A	N/A	0.06	N/A	N/A
		Max:	7	10	33	0	0	12	17	385	0	0	0.01	0.01	0.10	0.00	0.00

Composite Arsenic Concentration is ≥ 250 mg/kg.
Composite Lead Concentration is ≥ 1,200 mg/kg.
Composite Mercury Concentration is ≥ 147 mg/kg.
N/A = Not applicable per 2022 RMAP Quality Assurance Project Plan.

ISM SAMPLING DATA SUMMARY

Resident ID	SAMPLING COMPONENTS	COMPONENT SURFACE AREA (Square Feet)	ISM ARSENIC CONCENTRATION (mg/kg)		ISM LEAD CONCENTRATION (mg/kg)		ISM MERCURY CONCENTRATION (mg/kg)	
P-0009			0-2"	2-12"	0-2"	2-12"	0-2"	2-12"
P-0009-IS1	ISM Replicate A	19,719	20	33	107	145	0.08	0.03
P-0009-IS1	ISM Replicate B		25	33	135	181	0.05	0.08
P-0009-IS1	ISM Replicate C		18	34	75	898	0.04	0.11
		95% UCL:	27	34	181	1,477	0.11	0.18

ISM Arsenic 95% UCL is ≥ 250 mg/kg.
ISM Lead 95% UCL is ≥ 1,200 mg/kg.
ISM Mercury 95% UCL is ≥ 147 mg/kg.
N/A = Not applicable per 2022 RMAP Quality Assurance Project Plan.

REMEDIAL ACTION SUMMARY

Resident ID	SAMPLING COMPONENTS	COMPONENT SURFACE AREA (Square Feet)	ESTIMATED QUANTITIES			
P-0009			Excavation (Cubic Yards)	Lime (Cubic Yards)	General Backfill (Cubic Yards)	Sod (Square Feet)
P-0009-PA1	Playground Area 1 (PA1)	3,548	0	0	0	0
P-0009-IS1	ISM Polygon	19,719	852	122	730	19,719
		23,267	**852**	**122**	**730**	**19,719**

COPPER/EMMETT
INDIVIDUAL SITE WORK PLAN

RESIDENTIAL METALS
ABATEMENT PROGRAM (RMAP)

BUTTE, MONTANA
SHEET 2 OF 2

DRAFT
DATA VALIDATION NOT YET COMPLETE

Atlantic Richfield Company
A BP affiliated company

BY: PIONEER TECHNICAL SERVICES, INC.

Attachment B
Sugar Beet Lime Quality Assurance Data

Attachment B-1 Energy Laboratories, Inc. Data Reports

APPENDIX B - SUGAR BEET LIME QA DATA
(From ARWW&S, RDU 3)

	Sample ID	Date Collected	Butte Hill Reveg Spec:	Lime % as $CaCO_3$	% Passing No. 60 Screen (dry)
				Min of 65%	Min of 50%
1	22RDU3_SBL_011	06/13/22	Volume Tested: Approximatley 4,500 cy	78.4%	93.9%
2	22RDU3_SBL_012	06/13/22		77.4%	94.3%
3	22RDU3_SBL_013	06/13/22		76.9%	92.8%
4	22RDU3_SBL_014	06/29/22		77.9%	95.7%
5	22RDU3_SBL_015	06/29/22		78.4%	95.9%
6	22RDU3_SBL_016	07/07/22		76.4%	99.3%
7	22RDU3_SBL_017	07/07/22		78.8%	98.5%
8	22RDU3_SBL_018	07/12/22		77.9%	97.0%
9	22RDU3_SBL_019	07/12/22		77.4%	96.3%
			MAX:	78.8%	99.3%
			MIN:	76.4%	92.8%
			AVE:	77.7%	96.0%

Attachment B-1
Energy Laboratories, Inc. Data Reports

ANALYTICAL SUMMARY REPORT

June 28, 2022

Woodard and Curran
1015 S Montana St
Butte, MT 59701-2805

Work Order: B22061398 Quote ID: B5361

Project Name: ARWW&S, RDU3, 0232257.03

Energy Laboratories Inc Billings MT received the following 3 samples for Woodard and Curran on 6/15/2022 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B22061398-001	22RDU_3_SBL_011	06/13/22 14:45	06/15/22	Solid	Lime as CaCO3, % Moisture Sieve Analysis, Dry Sieve Analysis, Wet
B22061398-002	22RDU_3_SBL_012	06/13/22 14:50	06/15/22	Solid	Same As Above
B22061398-003	22RDU_3_SBL_013	06/13/22 14:55	06/15/22	Solid	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager.

Report Approved By:

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Woodard and Curran
Project: ARWW&S, RDU3, 0232257.03
Report Date: 06/28/22

Lab ID: B22061398-001
Client Sample ID: 22RDU_3_SBL_011
Collection Date: 06/13/22 14:45
DateReceived: 06/15/22
Matrix: Solid

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	28.6	wt%		0.2		D2974	06/21/22 10:09 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	78.4	%		0.1		USDA23c	06/28/22 07:52 / srm
SIEVE ANALYSIS							
No. 60 (250um), Retained	84.4	wt%-wet		0.1		SSSA 15-2	06/28/22 07:42 / srm
No. 60 (250um), Passed	93.9	wt%-dry		0.1		SSSA 15-2	06/22/22 14:51 / srm
Pan	< 0.1	wt%-dry		0.1		SSSA 15-2	06/22/22 14:51 / srm
Pan	15.6	wt%-wet		0.1		SSSA 15-2	06/28/22 07:42 / srm

Lab ID: B22061398-002
Client Sample ID: 22RDU_3_SBL_012
Collection Date: 06/13/22 14:50
DateReceived: 06/15/22
Matrix: Solid

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	28.8	wt%		0.2		D2974	06/21/22 10:09 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	77.4	%		0.1		USDA23c	06/28/22 07:52 / srm
SIEVE ANALYSIS							
No. 60 (250um), Retained	90.9	wt%-wet		0.1		SSSA 15-2	06/28/22 07:42 / srm
No. 60 (250um), Passed	94.3	wt%-dry		0.1		SSSA 15-2	06/22/22 14:51 / srm
Pan	< 0.1	wt%-dry		0.1		SSSA 15-2	06/22/22 14:51 / srm
Pan	9.1	wt%-wet		0.1		SSSA 15-2	06/28/22 07:42 / srm

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Woodard and Curran
Project: ARWW&S, RDU3, 0232257.03
Report Date: 06/28/22

Lab ID: B22061398-003
Client Sample ID: 22RDU_3_SBL_013
Collection Date: 06/13/22 14:55
DateReceived: 06/15/22
Matrix: Solid

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	27.5	wt%		0.2		D2974	06/21/22 10:09 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	76.9	%		0.1		USDA23c	06/28/22 07:52 / srm
SIEVE ANALYSIS							
No. 60 (250um), Retained	78.8	wt%-wet		0.1		SSSA 15-2	06/28/22 07:42 / srm
No. 60 (250um), Passed	92.8	wt%-dry		0.1		SSSA 15-2	06/22/22 14:51 / srm
Pan	< 0.1	wt%-dry		0.1		SSSA 15-2	06/22/22 14:51 / srm
Pan	21.2	wt%-wet		0.1		SSSA 15-2	06/28/22 07:42 / srm

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Woodard and Curran **Work Order:** B22061398 **Report Date:** 06/28/22

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **USDA23c**									Batch: R383791
Lab ID: **B22061398-001A DUP**	Sample Duplicate				Run: MISC-SOIL_220628A				06/28/22 07:52
Lime as CaCO3	78.4	%	0.10				0.0	30	
Lab ID: **LCS-2206280752**	Laboratory Control Sample				Run: MISC-SOIL_220628A				06/28/22 07:52
Lime as CaCO3	9.40	%	0.10	88	70	130			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

Work Order Receipt Checklist

Woodard and Curran

B22061398

Login completed by: Yvonna E. Smith
Date Received: 6/15/2022
Reviewed by: BL2000\lcadreau
Received by: srg
Reviewed Date: 6/19/2022
Carrier name: Return-FedEx Ground

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☑	Not Applicable ☐
Container/Temp Blank temperature:	14.3°C No Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

The reference date for Radon analysis is the sample collection date. The reference date for all other Radiochemical analyses is the analysis date. Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

Contact and Corrective Action Comments:

None

Chain of Custody and Analytical Request Record

PLEASE PRINT (Provide as much information as possible.)

Company Name: Woodard & Curran	Project Name, PWS, Permit, Etc.: ARWW&S, RDU3, 0232257.03	Sample Origin State: MT	EPA/State Compliance: Yes ☐ No ☐
Report Mail Address (Required): 1015 S Montana St Suite C, Butte MT, 59701 ☒ No Hard Copy Email: gcraig@woodardcurran.com	Contact Name: Garrett Craig; Phone/Fax: (406)291-2617; Cell: (406)291-2617		Sampler: (Please Print) Kristopher Bosch
	Invoice Contact & Phone: Kevin Bethke (406)586-8364	Purchase Order:	Quote/Bottle Order:
Invoice Address (Required): 1800 Koch Suite A, Bozeman MT, 59715 ☐ No Hard Copy Email: kbethke@woodardcurran.com			

Special Report/Formats:
☐ DW ☐ EDD/EDT (Electronic Data)
☐ POTW/WWTP Format: _____
☐ State: _____ ☐ LEVEL IV
☐ Other: _____ ☐ NELAC

Number of Containers
Sample Type: A Air W Water S Soils/Solids V Vegetation B Bioassay O Other D DW - Drinking Water

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	B5361 - Lime Quality	SEE ATTACHED
1	22RDU3_SBL_011	06/13/2022	14:45	S	✔	
2	22RDU3_SBL_012	06/13/2022	14:50	S	✔	
3	22RDU3_SBL_013	06/13/2022	14:55	S	✔	
4						
5						
6						
7						
8						
9						
10						

Standard Turnaround (TAT)

RUSH

Contact ELI prior to **RUSH** sample submittal for charges and scheduling – See Instruction Page

Comments:

Shipped by:

Cooler ID(s):

Receipt Temp _____ °C

On Ice: Y N

Custody Seal
On Bottle Y N
On Cooler Y N

Intact Y N

Signature Match Y N

LABORATORY USE ONLY B22061398

Custody Record MUST be Signed

	Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time:	Signature:
	Kristopher Bosch	06/13/2022 17:30				
	Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time:	Signature:
				Received by Laboratory: Staci Gotlob	Date/Time: 6/15/22 09:20	Signature: Staci Gotlob

Sample Disposal: Return to Client: _____ Lab Disposal: ✔

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested.
This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report.
Visit our web site at www.energylab.com for additional information, downloadable fee schedule, forms, and links.

ANALYTICAL SUMMARY REPORT

July 13, 2022

Woodard and Curran
1015 S Montana St
Butte, MT 59701-2805

Work Order: B22070163 Quote ID: B5361

Project Name: ARWW&S 0232257.04

Energy Laboratories Inc Billings MT received the following 2 samples for Woodard and Curran on 7/5/2022 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B22070163-001	22RDU3_SBL_014	06/29/22 17:00	07/05/22	Solid	Lime as CaCO3, % Moisture Sieve Analysis, Dry Sieve Analysis, Wet
B22070163-002	22RDU3_SBL_015	06/29/22 17:10	07/05/22	Solid	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager.

Report Approved By:

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Woodard and Curran
Project: ARWW&S 0232257.04
Report Date: 07/13/22

Lab ID: B22070163-001
Client Sample ID: 22RDU3_SBL_014
Collection Date: 06/29/22 17:00
DateReceived: 07/05/22
Matrix: Solid

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	23.8	wt%		0.2		D2974	07/08/22 10:15 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	77.9	%		0.1		USDA23c	07/13/22 15:11 / srm
SIEVE ANALYSIS							
No. 60 (250um), Retained	93.5	wt%-wet		0.1		SSSA 15-2	07/12/22 11:37 / srm
No. 60 (250um), Passed	95.7	wt%-dry		0.1		SSSA 15-2	07/08/22 11:26 / srm
Pan	< 0.1	wt%-dry		0.1		SSSA 15-2	07/08/22 11:26 / srm
Pan	6.5	wt%-wet		0.1		SSSA 15-2	07/12/22 11:37 / srm

Lab ID: B22070163-002
Client Sample ID: 22RDU3_SBL_015
Collection Date: 06/29/22 17:10
DateReceived: 07/05/22
Matrix: Solid

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	22.3	wt%		0.2		D2974	07/08/22 10:15 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	78.4	%		0.1		USDA23c	07/13/22 15:11 / srm
SIEVE ANALYSIS							
No. 60 (250um), Retained	88.1	wt%-wet		0.1		SSSA 15-2	07/12/22 11:37 / srm
No. 60 (250um), Passed	95.9	wt%-dry		0.1		SSSA 15-2	07/08/22 11:26 / srm
Pan	< 0.1	wt%-dry		0.1		SSSA 15-2	07/08/22 11:26 / srm
Pan	11.9	wt%-wet		0.1		SSSA 15-2	07/12/22 11:37 / srm

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Woodard and Curran **Work Order:** B22070163 **Report Date:** 07/13/22

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **USDA23c**									Batch: R384614
Lab ID: **B22070163-001A DUP**	Sample Duplicate				Run: MISC-SOIL_220713B				07/13/22 15:11
Lime as CaCO3	78.4	%	0.10				0.6	30	
Lab ID: **LCS-2207131511**	Laboratory Control Sample				Run: MISC-SOIL_220713B				07/13/22 15:11
Lime as CaCO3	9.80	%	0.10	92	70	130			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

Work Order Receipt Checklist

Woodard and Curran

B22070163

Login completed by: Dylan A. Chirrick
Date Received: 7/5/2022
Reviewed by: gmccartney
Received by: dac
Reviewed Date: 7/9/2022
Carrier name: Return-FedEx Ground

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☑	Not Applicable ☐
Container/Temp Blank temperature:	25.3°C No Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

The reference date for Radon analysis is the sample collection date. The reference date for all other Radiochemical analyses is the analysis date. Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

Contact and Corrective Action Comments:

The sample identification indicated on the container label for sample 22RDU3_SBL_015 is 22RDU3_SBL_015 and on the Chain of Custody it is 22RDU3_SBL_15. Proceeded with the sample identification as indicated on the sample container.

Chain of Custody and Analytical Request Record

PLEASE PRINT (Provide as much information as possible.)

Company Name:	Project Name, PWS, Permit, Etc.	Sample Origin	EPA/State Compliance:
Woodard & Curran	ARWW&S 0232257.04	State: MT	Yes ☐ No ☐

Report Mail Address (Required):	Contact Name:	Phone/Fax:	Cell:	Sampler: (Please Print)
1015 S Montana St Suite C, Butte MT, 59701 ☒ No Hard Copy Email: gcraig@woodardcurran.com	Garrett Craig	(406)291-2617	(406)291-2617	Shyla Wesely

Invoice Address (Required):	Invoice Contact & Phone:	Purchase Order:	Quote/Bottle Order:
1800 Koch Suite A, Bozeman MT, 59715 ☐ No Hard Copy Email: kbethke@woodardcurran.com	Kevin Bethke (406)586-8364		

Special Report/Formats:
☐ DW ☐ EDD/EDT (Electronic Data)
☐ POTW/WWTP Format: _____
☐ State: _____ ☐ LEVEL IV
☐ Other: _____ ☐ NELAC

Number of Containers
Sample Type: A W S V B O DW
Air Water Soils/Solids
Vegetation Bioassay Other
DW - Drinking Water

ANALYSIS REQUESTED

SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	B5361 - Lime Quality	SEE ATTACHED
1 22RDU3_SBL_014	6/29/22	1700	S	✔	
2 22RDU3_SBL_15	6/29/22	1710	S	✔	
3					
4					
5					
6					
7					
8					
9					
10					

Standard Turnaround (TAT)

→ R U S H

Contact ELI prior to **RUSH** sample submittal for charges and scheduling – See Instruction Page

Comments:

Shipped by:

Cooler ID(s):

Receipt Temp _____ °C

On Ice: Y N

Custody Seal
On Bottle Y N
On Cooler Y N

Intact Y N

Signature Match Y N

LABORATORY USE ONLY B2207063

Custody Record MUST be Signed

Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time:	Signature:
Shyla Wesely	6/29/22				
Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time:	Signature:
			Received by Laboratory: Dylan Chirico	Date/Time: 7/5/22 11:15	Signature:

Sample Disposal: Return to Client: _____ Lab Disposal: _____

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested.
This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report.
Visit our web site at www.energylab.com for additional information, downloadable fee schedule, forms, and links.

ANALYTICAL SUMMARY REPORT

July 20, 2022

Woodard and Curran
1015 S Montana St
Butte, MT 59701-2805

Work Order: B22070686 Quote ID: B5361

Project Name: ARWW&S, RDU3, 0232257.03

Energy Laboratories Inc Billings MT received the following 2 samples for Woodard and Curran on 7/11/2022 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B22070686-001	22RDU3_SBL_016	07/07/22 11:20	07/11/22	Solid	Lime as CaCO3, % Moisture Sieve Analysis, Dry Sieve Analysis, Wet
B22070686-002	22RDU3_SBL_017	07/07/22 11:25	07/11/22	Solid	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager.

Report Approved By:

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Woodard and Curran
Project: ARWW&S, RDU3, 0232257.03
Report Date: 07/20/22

Lab ID: B22070686-001
Client Sample ID: 22RDU3_SBL_016
Collection Date: 07/07/22 11:20
DateReceived: 07/11/22
Matrix: Solid

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	25.7	wt%		0.2		D2974	07/19/22 09:43 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	76.4	%		0.1		USDA23c	07/20/22 15:36 / srm
SIEVE ANALYSIS							
No. 60 (250um), Retained	76.9	wt%-wet		0.1		SSSA 15-2	07/20/22 11:27 / srm
No. 60 (250um), Passed	99.3	wt%-dry		0.1		SSSA 15-2	07/19/22 10:34 / srm
Pan	< 0.1	wt%-dry		0.1		SSSA 15-2	07/19/22 10:34 / srm
Pan	23.1	wt%-wet		0.1		SSSA 15-2	07/20/22 11:27 / srm

Lab ID: B22070686-002
Client Sample ID: 22RDU3_SBL_017
Collection Date: 07/07/22 11:25
DateReceived: 07/11/22
Matrix: Solid

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	25.9	wt%		0.2		D2974	07/19/22 09:43 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	78.8	%		0.1		USDA23c	07/20/22 15:36 / srm
SIEVE ANALYSIS							
No. 60 (250um), Retained	26.8	wt%-wet		0.1		SSSA 15-2	07/20/22 11:27 / srm
No. 60 (250um), Passed	98.5	wt%-dry		0.1		SSSA 15-2	07/19/22 10:34 / srm
Pan	< 0.1	wt%-dry		0.1		SSSA 15-2	07/19/22 10:34 / srm
Pan	73.2	wt%-wet		0.1		SSSA 15-2	07/20/22 11:27 / srm

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Woodard and Curran **Work Order:** B22070686 **Report Date:** 07/20/22

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: USDA23c									Batch: R384936
Lab ID: B22070686-001A DUP	Sample Duplicate				Run: MISC-SOIL_220720B				07/20/22 15:36
Lime as CaCO3	75.9	%	0.10				0.7	30	
Lab ID: LCS-2207201536	Laboratory Control Sample				Run: MISC-SOIL_220720B				07/20/22 15:36
Lime as CaCO3	9.50	%	0.10	89	70	130			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

Work Order Receipt Checklist

Woodard and Curran

B22070686

Login completed by: Dylan A. Chirrick
Reviewed by: BL2000\lcadreau
Reviewed Date: 7/12/2022
Date Received: 7/11/2022
Received by: dac
Carrier name: Return-FedEx Ground

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Applicable ☐
Container/Temp Blank temperature:	24.0°C No Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

The reference date for Radon analysis is the sample collection date. The reference date for all other Radiochemical analyses is the analysis date. Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

Contact and Corrective Action Comments:

None

Chain of Custody and Analytical Request Record

Page 1 of 1

PLEASE PRINT (Provide as much information as possible.)

Company Name: Woodard & Curran	Project Name, PWS, Permit, Etc.: ARWW&S, RDU3, 0232257.03	Sample Origin State: MT	EPA/State Compliance: Yes ☐ No ☐
Report Mail Address (Required): 1015 S Montana St Suite C, Butte MT, 59701 ☑ No Hard Copy Email: gcraig@woodardcurran.com	Contact Name: Garrett Craig; Phone/Fax: (406)291-2617; Cell: (406)291-2617		Sampler: (Please Print) Kristopher Bosch
	Invoice Contact & Phone: Kevin Bethke (406)586-8364	Purchase Order:	Quote/Bottle Order:
Invoice Address (Required): 1800 Koch Suite A, Bozeman MT, 59715 ❑ No Hard Copy Email: kbethke@woodardcurran.com			

Special Report/Formats:
☐ DW ☐ POTW/WWTP ☐ State: _____ ☐ Other: _____ ☐ EDD/EDT (Electronic Data) Format: _____ ☐ LEVEL IV ☐ NELAC

Number of Containers
Sample Type: A W S V B O DW
Air Water Soils/Solids Vegetation Bioassay Other DW - Drinking Water

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	B5361 - Lime Quality	SEE ATTACHED
1	22RDU3_SBL_016	07/07/2022	11:20	S	✓	
2	22RDU3_SBL_017	07/07/2022	11:25	S	✓	
3						
4						
5						
6						
7						
8						
9						
10						

Standard Turnaround (TAT)

RUSH

Contact ELI prior to **RUSH** sample submittal for charges and scheduling – See Instruction Page

Comments:

Shipped by:

Cooler ID(s):

Receipt Temp ____ °C

On Ice: Y N

Custody Seal On Bottle Y N On Cooler Y N

Intact Y N

Signature Match Y N

LABORATORY USE ONLY B22070686

Custody Record MUST be Signed

Relinquished by (print): Hannah Foster	Date/Time: 07/08/22 12:00	Signature: Hannah Foster 7/8/22 12:00pm	Received by (print):
Relinquished by (print):	Date/Time:	Signature:	Received by (print):
Sample Disposal: Return to Client: _____ Lab Disposal: ✓			Received by Laboratory: Date/Time: 7/11/22 11:15 Signature:

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested.
This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report.
Visit our web site at www.energylab.com for additional information, downloadable fee schedule, forms, and links.

ANALYTICAL SUMMARY REPORT

July 20, 2022

Woodard and Curran
1015 S Montana St
Butte, MT 59701-2805

Work Order: B22071162 Quote ID: B5361

Project Name: ARWW&S, RDU3, 0232257.03

Energy Laboratories Inc Billings MT received the following 2 samples for Woodard and Curran on 7/14/2022 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B22071162-001	22RDU3_SBL_018	07/12/22 15:00	07/14/22	Solid	Lime as CaCO3, % Moisture Sieve Analysis, Dry Sieve Analysis, Wet
B22071162-002	22RDU3_SBL_019	07/12/22 15:05	07/14/22	Solid	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager.

Report Approved By:

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Woodard and Curran
Project: ARWW&S, RDU3, 0232257.03
Report Date: 07/20/22

Lab ID: B22071162-001
Client Sample ID: 22RDU3_SBL_018
Collection Date: 07/12/22 15:00
DateReceived: 07/14/22
Matrix: Solid

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	23.4	wt%		0.2		D2974	07/19/22 09:43 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	77.9	%		0.1		USDA23c	07/20/22 15:36 / srm
SIEVE ANALYSIS							
No. 60 (250um), Retained	60.8	wt%-wet		0.1		SSSA 15-2	07/20/22 11:27 / srm
No. 60 (250um), Passed	97.0	wt%-dry		0.1		SSSA 15-2	07/19/22 10:36 / srm
Pan	< 0.1	wt%-dry		0.1		SSSA 15-2	07/19/22 10:36 / srm
Pan	39.2	wt%-wet		0.1		SSSA 15-2	07/20/22 11:27 / srm

Lab ID: B22071162-002
Client Sample ID: 22RDU3_SBL_019
Collection Date: 07/12/22 15:05
DateReceived: 07/14/22
Matrix: Solid

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	31.7	wt%		0.2		D2974	07/19/22 09:43 / srm
CHEMICAL CHARACTERISTICS							
Lime as CaCO3	77.4	%		0.1		USDA23c	07/20/22 15:36 / srm
SIEVE ANALYSIS							
No. 60 (250um), Retained	79.7	wt%-wet		0.1		SSSA 15-2	07/20/22 11:27 / srm
No. 60 (250um), Passed	96.3	wt%-dry		0.1		SSSA 15-2	07/19/22 10:36 / srm
Pan	< 0.1	wt%-dry		0.1		SSSA 15-2	07/19/22 10:36 / srm
Pan	20.3	wt%-wet		0.1		SSSA 15-2	07/20/22 11:27 / srm

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Woodard and Curran **Work Order:** B22071162 **Report Date:** 07/20/22

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: USDA23c									Batch: R384936
Lab ID: B22070686-001A DUP	Sample Duplicate				Run: MISC-SOIL_220720B				07/20/22 15:36
Lime as CaCO3	75.9	%	0.10				0.7	30	
Lab ID: LCS-2207201536	Laboratory Control Sample				Run: MISC-SOIL_220720B				07/20/22 15:36
Lime as CaCO3	9.50	%	0.10	89	70	130			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

Work Order Receipt Checklist

Woodard and Curran

B22071162

Login completed by: Tyler J. Gasser
Date Received: 7/14/2022
Reviewed by: gmccartney
Received by: tae
Reviewed Date: 7/19/2022
Carrier name: Return-FedEx Ground

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Applicable ☐
Container/Temp Blank temperature:	22.4°C No Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

The reference date for Radon analysis is the sample collection date. The reference date for all other Radiochemical analyses is the analysis date. Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

Contact and Corrective Action Comments:

None

Chain of Custody and Analytical Request Record

PLEASE PRINT (Provide as much information as possible.)

Company Name: Woodard & Curran	Project Name, PWS, Permit, Etc.: ARWW&S, RDU3, 0232257.03	Sample Origin: State: MT	EPA/State Compliance: Yes ☐ No ☐
Report Mail Address (Required): 1015 S Montana St Suite C, Butte MT, 59701	Contact Name: Garrett Craig / Phone/Fax: (406)291-2617	Cell: (406)291-2617	Sampler: (Please Print) Kristopher Bosch
☒ No Hard Copy Email: gcraig@woodardcurran.com	Invoice Contact & Phone: Kevin Bethke (406)586-8364	Purchase Order:	Quote/Bottle Order:
Invoice Address (Required): 1800 Koch Suite A, Bozeman MT, 59715			
☐ No Hard Copy Email: kbethke@woodardcurran.com			

Special Report/Formats:
☐ DW ☐ POTW/WWTP ☐ State: _____ ☐ Other: _____ ☐ EDD/EDT (Electronic Data) Format: _____ ☐ LEVEL IV ☐ NELAC

Number of Containers
Sample Type: A W S V B O DW
Air Water Soils/Solids Vegetation Bioassay Other DW - Drinking Water

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	B5361 - Lime Quality	SEE ATTACHED
1	22RDU3_SBL_018	07/12/2022	15:00	S	✔	
2	22RDU3_SBL_019	07/12/2022	15:05	S	✔	
3						
4						
5						
6						
7						
8						
9						
10						

Standard Turnaround (TAT)

RUSH

Contact ELI prior to **RUSH** sample submittal for charges and scheduling – See Instruction Page

Comments:

Shipped by:
Cooler ID(s):
Receipt Temp ____ °C
On Ice: Y N
Custody Seal: On Bottle Y N; On Cooler Y N
Intact Y N
Signature Match Y N

LABORATORY USE ONLY B22071162

Custody Record MUST be Signed

Relinquished by (print): Hannah Foster	Date/Time: 07/13/22 12:00	Signature: Hannah Foster 7/13/22 12:00	Received by (print):	Date/Time: / Signature:
Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time: / Signature:
Sample Disposal: Return to Client: _____	Lab Disposal: ✔		Received by Laboratory: Tabitha Edwards	Date/Time: 7-14-22 0915 / Signature:

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested.
This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report.
Visit our web site at www.energylab.com for additional information, downloadable fee schedule, forms, and links.

Attachment C
Fabric Specification Sheet

WINFAB®

REINFORCING SUCCESS

PRODUCT DATA SHEET
WINFAB® 1000NE

EROSION PROTECTION | FILTRATION | DRAINAGE | SEPARATION

WINFAB® 1000NE needle-punched nonwoven geotextile is manufactured using polypropylene fibers that are formed into a dimensionally stable network, which allows the fibers to maintain their relative position.

WINFAB® 1000NE needle-punched nonwoven geotextile resists ultraviolet deterioration, rotting, and biological degradation and is inert to commonly encountered soil chemicals.

PROPERTY	TEST METHOD	MARV ENGLISH	MARV METRIC
Weight	ASTM D5261	10.0 oz/yd^2	339 g/m^2
Thickness	ASTM D5199	110 mils	2.79 mm
Tensile Strength (Grab)	ASTM D4632	270 x 270 lbs	1,201 x 1,201 N
Elongation (Grab)	ASTM D4632	50% x 50%	50% x 50%
Trapezoidal Tear Strength	ASTM D4533	100 x 100 lbs	445 x 445 N
CBR Puncture	ASTM D6241	725 lbs	3,225 N
UV Resistance (500 hrs)	ASTM D4355	70%	70%
Apparent Opening Size*	ASTM D4751	100 US Std. Sieve	0.150 mm
Permittivity	ASTM D4491	0.94 sec^{-1}	0.94 sec^{-1}
Permeability	ASTM D4491	.30 cm/sec	.30 cm-sec
Water Flow Rate	ASTM D4491	75 gpm/ft^2	3,055 lpm/m^2

***Maximum Average Roll Value**

PROPERTY	TEST METHOD	TYPICAL ENGLISH	TYPICAL METRIC
Roll Dimensions	Measured	15 ft x 570 ft	4.58 x 173.74 m
Roll Area	Measured	950 yd^2	795.73 m^2

WINFAB | www.winfabusa.com
1 Nashville Mills Rd. Nashville GA 31639
Ph: (912) 534-5757 • Fax: (912) 534-5533

GMA Geosynthetic Materials Association

GAI-LAP
Initials: GK # : 87
Date: 2016

ATTACHMENT D

AGENCY APPROVED RACETRACK BORROW STOCKPILE DATA

Attachment D-1 Racetrack Borrow 2021 Characterization Data Lab Report
Attachment D-2 Racetrack Borrow 2023 QA Data Lab Reports

BUTTE HILL COVER SOIL APPROVAL SUBMITTAL

5/6/2023

Source: ***Racetrack Borrow***
Sample #: ***1 - Quadrant #1***

Description		Specification		Sample	Specification Met: Yes	Specification Met: No
Chemical (mg/kg)						
	As	<	97	25.0	X	
	Cd	<	4	0.0	X	
	Cu	<	250	67.0	X	
	Hg	<	5	0.00	X	
	Pb	<	100	22.0	X	
	Zn	<	250	76.0	X	
pH (s.u.)		>	5.5	7.6	X	
		<	8.5			
SAR		<	12	1.40	X	
Saturation (%)		<	85	52.8	X	
		>	25			
EC (mmhos/cm)		<	4	1.9	X	
Textural Classification (USDA) <2.0 mm						
	Loam				X	
	Sandy loam					
	Sandy clay loam					
	Sandy clay					
	Clay loam					
	Silty clay					
	Silty clay loam					
	Silt loam					
	Silt					
	*Per EPA Approval (Loamy sand)					
Rock Content (%) (by volume)		<	45	10	X	

Other Information Requested	
Organic Matter (%)	
	3.60
Soil Nutrients	
N (mg/kg)	N/A
P (mg/kg)	N/A
K (mg/kg)	N/A
Particle Size	
Sand (%)	48
Silt (%)	30
Clay (%)	22

Legend:

# Value	- Criteria met
# Value	- Does not meet Criteria

Atlantic Richfield Representative: Mike McInulty Date: 5-10-23

EPA Representative: NIKIA GREENE Digitally signed by NIKIA GREENE Date: 2023.06.08 06:35:41 -06'00' Date:

MT DEQ Representative: Date: 6/7/2023

BUTTE HILL COVER SOIL APPROVAL SUBMITTAL

5/6/2023

Source: ***Racetrack Borrow***
Sample #: ***2 - Quadrant #2***

Description		Specification		Sample	Specification Met: Yes	Specification Met: No
Chemical (mg/kg)						
	As	<	97	37.0	X	
	Cd	<	4	1.0	X	
	Cu	<	250	86.0	X	
	Hg	<	5	0.00	X	
	Pb	<	100	28.0	X	
	Zn	<	250	88.0	X	
pH (s.u.)						
		>	5.5	7.6	X	
		<	8.5			
SAR						
		<	12	0.80	X	
Saturation (%)						
		<	85	51.1	X	
		>	25			
EC (mmhos/cm)						
		<	4	1	X	
Textural Classification (USDA) <2.0 mm						
	Loam					
	Sandy loam					
	Sandy clay loam				X	
	Sandy clay					
	Clay loam					
	Silty clay					
	Silty clay loam					
	Silt loam					
	Silt					
	*Per EPA Approval (Loamy sand)					
Rock Content (%) (by volume)		<	45	9	X	

Other Information Requested	
Organic Matter (%)	
	4.50
Soil Nutrients	
N (mg/kg)	N/A
P (mg/kg)	N/A
K (mg/kg)	N/A
Particle Size	
Sand (%)	54
Silt (%)	26
Clay (%)	20

Legend:

# Value	- Criteria met
# Value	- Does not meet Criteria

Atlantic Richfield Representative: Mike McAnulty Date: 5-10-23

EPA Representative: NIKIA GREENE Digitally signed by NIKIA GREENE Date: 2023.06.08 06:37:40 -06'00' Date:

MT DEQ Representative: Date: 6/7/2023

BUTTE HILL COVER SOIL APPROVAL SUBMITTAL

5/6/2023

Source: ***Racetrack Borrow***
Sample #: ***3 - Quadrant #3***

Description		Specification		Sample	Specification Met: Yes	Specification Met: No
Chemical (mg/kg)						
	As	<	97	30.0	X	
	Cd	<	4	0.0	X	
	Cu	<	250	52.0	X	
	Hg	<	5	0.00	X	
	Pb	<	100	18.0	X	
	Zn	<	250	64.0	X	
pH (s.u.)						
		>	5.5	7.6	X	
		<	8.5			
SAR						
		<	12	0.40	X	
Saturation (%)						
		<	85	40.8	X	
		>	25			
EC (mmhos/cm)						
		<	4	0.8	X	
Textural Classification (USDA) <2.0 mm						
	Loam					
	Sandy loam				X	
	Sandy clay loam					
	Sandy clay					
	Clay loam					
	Silty clay					
	Silty clay loam					
	Silt loam					
	Silt					
	*Per EPA Approval (Loamy sand)					
Rock Content (%) (by volume)		<	45	11	X	

Organic Matter (%)

	2.8

Soil Nutrients

N (mg/kg)	N/A
P (mg/kg)	N/A
K (mg/kg)	N/A

Particle Size

Sand (%)	56
Silt (%)	26
Clay (%)	18

Legend:

# Value	- Criteria met
# Value	- Does not meet Criteria

Atlantic Richfield Representative: Mike McAnulty Date: 5-10-23

EPA Representative: NIKIA GREENE Digitally signed by NIKIA GREENE Date: 2023.06.08 06:40:49 -06'00' Date:

MT DEQ Representative: Taylor Reed Date: 6/7/2023

BUTTE HILL COVER SOIL APPROVAL SUBMITTAL

5/6/2023

Source: ***Racetrack Borrow***
Sample #: ***4 - Quadrant #4***

Description		Specification		Sample	Specification Met: Yes	Specification Met: No
Chemical (mg/kg)						
	As	<	97	38.0	X	
	Cd	<	4	0.0	X	
	Cu	<	250	59.0	X	
	Hg	<	5	0.00	X	
	Pb	<	100	20.0	X	
	Zn	<	250	76.0	X	
pH (s.u.)						
		>	5.5	7.3	X	
		<	8.5			
SAR						
		<	12	1.70	X	
Saturation (%)						
		<	85	42.4	X	
		>	25			
EC (mmhos/cm)						
		<	4	1.3	X	
Textural Classification (USDA) <2.0 mm						
	Loam					
	Sandy loam				X	
	Sandy clay loam					
	Sandy clay					
	Clay loam					
	Silty clay					
	Silty clay loam					
	Silt loam					
	Silt					
	*Per EPA Approval (Loamy sand)					
Rock Content (%) (by volume)		<	45	15	X	

Other Information Requested	
Organic Matter (%)	**2.6**
Soil Nutrients	
N (mg/kg)	N/A
P (mg/kg)	N/A
K (mg/kg)	N/A
Particle Size	
Sand (%)	62
Silt (%)	24
Clay (%)	14

Legend:

# Value	- Criteria met
# Value	- Does not meet Criteria

Atlantic Richfield Representative: Mike McAnulty Date: 5-10-23

EPA Representative: NIKIA GREENE Digitally signed by NIKIA GREENE Date: 2023.06.12 07:01:56 -06'00' Date:

MT DEQ Representative: Date: 6/7/2023

BUTTE HILL COVER SOIL APPROVAL SUBMITTAL

5/6/2023

Source: ***Racetrack Borrow***
Sample #: ***5 - 23-ICS-0406-01***

Description		Specification		Sample	Specification Met: Yes	Specification Met: No
Chemical (mg/kg)						
	As	<	97	25.9	X	
	Cd	<	4	0.8	X	
	Cu	<	250	69.9	X	
	Hg	<	5	0.02	X	
	Pb	<	100	24.4	X	
	Zn	<	250	92.8	X	
pH (s.u.)						
		>	5.5	7.1	X	
		<	8.5			
SAR						
		<	12	0.37	X	
Saturation (%)						
		<	85	36.9	X	
		>	25			
EC (mmhos/cm)						
		<	4	1.2	X	
Textural Classification (USDA) <2.0 mm						
	Loam					
	Sandy loam				X	
	Sandy clay loam					
	Sandy clay					
	Clay loam					
	Silty clay					
	Silty clay loam					
	Silt loam					
	Silt					
	*Per EPA Approval (Loamy sand)					
Rock Content (%) (by volume)		<	45	9	X	

Other Information Requested	
Organic Matter (%)	
2.1	
Soil Nutrients	
N (mg/kg)	N/A
P (mg/kg)	N/A
K (mg/kg)	N/A
Particle Size	
Sand (%)	56
Silt (%)	34
Clay (%)	10

Legend:

# Value	- Criteria met
# Value	- Does not meet Criteria

Atlantic Richfield Representative: Mike McAnulty Date: 5-10-23

EPA Representative: NIKIA GREENE Digitally signed by NIKIA GREENE Date: 2023.06.12 07:05:14 -06'00' Date:

MT DEQ Representative: Date: 6/7/2023

BUTTE HILL COVER SOIL APPROVAL SUBMITTAL

5/6/2023

Source: ***Racetrack Borrow***
Sample #: ***6 - 23-ICS-0406-02***

Description		Specification		Sample	Specification Met: Yes	Specification Met: No
Chemical (mg/kg)						
	As	<	97	24.5	X	
	Cd	<	4	0.7	X	
	Cu	<	250	58.2	X	
	Hg	<	5	0.02	X	
	Pb	<	100	22.3	X	
	Zn	<	250	79.1	X	
pH (s.u.)		>	5.5	7.2	X	
		<	8.5			
SAR		<	12	0.42	X	
Saturation (%)		<	85	33	X	
		>	25			
EC (mmhos/cm)		<	4	1.2	X	
Textural Classification (USDA) <2.0 mm						
	Loam					
	Sandy loam				X	
	Sandy clay loam					
	Sandy clay					
	Clay loam					
	Silty clay					
	Silty clay loam					
	Silt loam					
	Silt					
	*Per EPA Approval (Loamy sand)					
Rock Content (%) (by volume)		<	45	8.4	X	

Other Information Requested	
Organic Matter (%)	**1.7**
Soil Nutrients	
N (mg/kg)	N/A
P (mg/kg)	N/A
K (mg/kg)	N/A
Particle Size	
Sand (%)	61
Silt (%)	30
Clay (%)	9

Legend:

# Value	- Criteria met
# Value	- Does not meet Criteria

Atlantic Richfield Representative: Mike McAnulty Date: 5-10-23

EPA Representative: NIKIA GREENE Digitally signed by NIKIA GREENE Date: 2023.06.12 07:07:19 -06'00' Date:

MT DEQ Representative: Date: 6/7/2023

BUTTE HILL COVER SOIL APPROVAL SUBMITTAL

5/6/2023

Source: ***Racetrack Borrow***
Sample #: ***7 - 23-ICS-0406-03***

Description		Specification		Sample	Specification Met: Yes	Specification Met: No
Chemical (mg/kg)						
	As	<	97	23.9	X	
	Cd	<	4	0.7	X	
	Cu	<	250	49.9	X	
	Hg	<	5	0.01	X	
	Pb	<	100	19.1	X	
	Zn	<	250	164.0	X	
pH (s.u.)		>	5.5	7.1	X	
		<	8.5			
SAR		<	12	0.49	X	
Saturation (%)		<	85	27.1	X	
		>	25			
EC (mmhos/cm)		<	4	0.8	X	
Textural Classification (USDA) <2.0 mm						
	Loam					
	Sandy loam				X	
	Sandy clay loam					
	Sandy clay					
	Clay loam					
	Silty clay					
	Silty clay loam					
	Silt loam					
	Silt					
	*Per EPA Approval (Loamy sand)					
Rock Content (%) (by volume)		<	45	11.8	X	

Other Information Requested	
Organic Matter (%)	**1.2**
Soil Nutrients	
N (mg/kg)	N/A
P (mg/kg)	N/A
K (mg/kg)	N/A
Particle Size	
Sand (%)	65
Silt (%)	27
Clay (%)	8

Legend:

# Value	- Criteria met
# Value	- Does not meet Criteria

Atlantic Richfield Representative: Mike McAnulty Date: 5-10-23

EPA Representative: NIKIA GREENE Digitally signed by NIKIA GREENE Date: 2023.06.12 07:09:46 -06'00' Date:

MT DEQ Representative: Date: 6/7/2023

BUTTE HILL COVER SOIL APPROVAL SUBMITTAL

5/6/2023

Source: ***Racetrack Borrow***
Sample #: ***8 - 23-ICS-0406-04***

Description	Specification	Sample	Specification Met: Yes	Specification Met: No	Other Information Requested
Chemical (mg/kg)					**Organic Matter (%)**
As	< 97	23.5	X		**2.2**
Cd	< 4	1.0	X		
Cu	< 250	72.9	X		**Soil Nutrients**
Hg	< 5	0.02	X		
Pb	< 100	25.8	X		N (mg/kg): N/A
Zn	< 250	104.0	X		P (mg/kg): N/A
pH (s.u.)					K (mg/kg): N/A
	> 5.5 < 8.5	7.4	X		
SAR					
	< 12	1.15	X		
Saturation (%)					
	< 85 > 25	32.6	X		
EC (mmhos/cm)					
	< 4	2.4	X		
Textural Classification (USDA) <2.0 mm					**Particle Size**
Loam					Sand (%): 63
Sandy loam			X		Silt (%): 29
Sandy clay loam					Clay (%): 8
Sandy clay					
Clay loam					
Silty clay					
Silty clay loam					
Silt loam					
Silt					
*Per EPA Approval (Loamy sand)					
Rock Content (%) (by volume)	< 45	9.8	X		

Legend:

# Value	- Criteria met
# Value	- Does not meet Criteria

Atlantic Richfield Representative: Mike McAnulty Date: 5-10-23

EPA Representative: NIKIA GREENE Digitally signed by NIKIA GREENE Date: 2023.06.12 07:11:59 -06'00' Date:

MT DEQ Representative: Date: 6/7/2023

BUTTE HILL COVER SOIL APPROVAL SUBMITTAL

5/6/2023

Source: ***Racetrack Borrow***
Sample #: ***9 - 23-ICS-0406-05***

Description		Specification		Sample	Specification Met: Yes	Specification Met: No
Chemical (mg/kg)						
	As	<	97	24.8	X	
	Cd	<	4	1.0	X	
	Cu	<	250	85.3	X	
	Hg	<	5	0.03	X	
	Pb	<	100	29.9	X	
	Zn	<	250	105.0	X	
pH (s.u.)		>	5.5	7.3	X	
		<	8.5			
SAR		<	12	0.44	X	
Saturation (%)		<	85	38.3	X	
		>	25			
EC (mmhos/cm)		<	4	1.4	X	
Textural Classification (USDA) <2.0 mm						
	Loam					
	Sandy loam				X	
	Sandy clay loam					
	Sandy clay					
	Clay loam					
	Silty clay					
	Silty clay loam					
	Silt loam					
	Silt					
	*Per EPA Approval (Loamy sand)					
Rock Content (%) (by volume)		<	45	7.9	X	

Organic Matter (%)

	2.8

Soil Nutrients

N (mg/kg)	N/A
P (mg/kg)	N/A
K (mg/kg)	N/A

Particle Size

Sand (%)	54
Silt (%)	36
Clay (%)	10

Legend:

# Value	- Criteria met
# Value	- Does not meet Criteria

Atlantic Richfield Representative: Mike McInulty Date: 5-10-23

EPA Representative: NIKIA GREENE Digitally signed by NIKIA GREENE Date: 2023.06.12 07:28:26 -06'00' Date:

MT DEQ Representative: Date: 6/7/2023

BUTTE HILL COVER SOIL APPROVAL SUBMITTAL

5/6/2023

Source: ***Racetrack Borrow***
Sample #: ***10 - 23-ICS-0406-06***

Description		Specification		Sample	Specification Met: Yes	Specification Met: No
Chemical (mg/kg)						
	As	<	97	23.8	X	
	Cd	<	4	0.9	X	
	Cu	<	250	71.8	X	
	Hg	<	5	0.02	X	
	Pb	<	100	24.2	X	
	Zn	<	250	96.8	X	
pH (s.u.)		>	5.5	7.4	X	
		<	8.5			
SAR		<	12	0.42	X	
Saturation (%)		<	85	33.7	X	
		>	25			
EC (mmhos/cm)		<	4	1.5	X	
Textural Classification (USDA) <2.0 mm						
	Loam					
	Sandy loam				X	
	Sandy clay loam					
	Sandy clay					
	Clay loam					
	Silty clay					
	Silty clay loam					
	Silt loam					
	Silt					
	*Per EPA Approval (Loamy sand)					
Rock Content (%) (by volume)		<	45	5.7	X	

Other Information Requested	
Organic Matter (%)	**2.2**
Soil Nutrients	
N (mg/kg)	N/A
P (mg/kg)	N/A
K (mg/kg)	N/A

Particle Size	
Sand (%)	61
Silt (%)	30
Clay (%)	9

Legend:

# Value	- Criteria met
# Value	- Does not meet Criteria

Atlantic Richfield Representative: Mike McAnulty Date: 5-10-23

EPA Representative: NIKIA GREENE Digitally signed by NIKIA GREENE Date: 2023.06.12 07:37:00 -06'00' Date:

MT DEQ Representative: Date: 6/7/2023

BUTTE HILL COVER SOIL APPROVAL SUBMITTAL

5/6/2023

Source: ***Racetrack Borrow***
Sample #: ***11 - 23-ICS-0406-07***

Description		Specification		Sample	Specification Met: Yes	Specification Met: No
Chemical (mg/kg)						
	As	<	97	23.2	X	
	Cd	<	4	0.7	X	
	Cu	<	250	57.7	X	
	Hg	<	5	0.02	X	
	Pb	<	100	21.2	X	
	Zn	<	250	79.3	X	
pH (s.u.)		>	5.5	7.3	X	
		<	8.5			
SAR		<	12	1.44	X	
Saturation (%)		<	85	36.9	X	
		>	25			
EC (mmhos/cm)		<	4	3.6	X	
Textural Classification (USDA) <2.0 mm						
	Loam					
	Sandy loam				X	
	Sandy clay loam					
	Sandy clay					
	Clay loam					
	Silty clay					
	Silty clay loam					
	Silt loam					
	Silt					
	*Per EPA Approval (Loamy sand)					
Rock Content (%) (by volume)		<	45	7.6	X	

Other Information Requested	
Organic Matter (%)	**2.4**
Soil Nutrients	
N (mg/kg)	N/A
P (mg/kg)	N/A
K (mg/kg)	N/A
Particle Size	
Sand (%)	57
Silt (%)	33
Clay (%)	10

Legend:

# Value	- Criteria met
# Value	- Does not meet Criteria

Atlantic Richfield Representative: Mike McAnulty Date: 5-10-23

EPA Representative: NIKIA GREENE Digitally signed by NIKIA GREENE Date: 2023.06.12 07:41:21 -06'00' Date:

MT DEQ Representative: Date: 6/7/2023

BUTTE HILL COVER SOIL APPROVAL SUBMITTAL

5/6/2023

Source: ***Racetrack Borrow***
Sample #: ***12 - 23-ICS-0406-08***

Description		Specification		Sample	Specification Met: Yes	Specification Met: No
Chemical (mg/kg)						
	As	<	97	31.4	X	
	Cd	<	4	1.2	X	
	Cu	<	250	79.6	X	
	Hg	<	5	0.02	X	
	Pb	<	100	27.1	X	
	Zn	<	250	96.1	X	
pH (s.u.)		>	5.5	7.4	X	
		<	8.5			
SAR		<	12	0.81	X	
Saturation (%)		<	85	35.3	X	
		>	25			
EC (mmhos/cm)		<	4	2.0	X	
Textural Classification (USDA) <2.0 mm						
	Loam					
	Sandy loam				X	
	Sandy clay loam					
	Sandy clay					
	Clay loam					
	Silty clay					
	Silty clay loam					
	Silt loam					
	Silt					
	*Per EPA Approval (Loamy sand)					
Rock Content (%) (by volume)		<	45	9.9	X	

Other Information Requested	
Organic Matter (%)	**2.3**
Soil Nutrients	
N (mg/kg)	N/A
P (mg/kg)	N/A
K (mg/kg)	N/A

Particle Size	
Sand (%)	64
Silt (%)	27
Clay (%)	9

Legend:

# Value	- Criteria met
# Value	- Does not meet Criteria

Atlantic Richfield Representative: Mike McInulty Date: 5-10-23

EPA Representative: NIKIA GREENE Digitally signed by NIKIA GREENE Date: 2023.06.12 07:44:04 -06'00' Date:

MT DEQ Representative: Date: 6/7/2023

BUTTE HILL COVER SOIL APPROVAL SUBMITTAL

5/6/2023

Source: ***Racetrack Borrow***
Sample #: ***13 - 23-ICS-0406-09***

Description		Specification		Sample	Specification Met: Yes	Specification Met: No
Chemical (mg/kg)						
	As	<	97	31.3	X	
	Cd	<	4	0.9	X	
	Cu	<	250	76.5	X	
	Hg	<	5	0.03	X	
	Pb	<	100	25.7	X	
	Zn	<	250	95.5	X	
pH (s.u.)		>	5.5	7.3	X	
		<	8.5			
SAR		<	12	1.13	X	
Saturation (%)		<	85	43.9	X	
		>	25			
EC (mmhos/cm)		<	4	2.9	X	
Textural Classification (USDA) <2.0 mm						
	Loam					
	Sandy loam				X	
	Sandy clay loam					
	Sandy clay					
	Clay loam					
	Silty clay					
	Silty clay loam					
	Silt loam					
	Silt					
	*Per EPA Approval (Loamy sand)					
Rock Content (%) (by volume)		<	45	6.5	X	

Other Information Requested	
Organic Matter (%)	
2.8	
Soil Nutrients	
N (mg/kg)	N/A
P (mg/kg)	N/A
K (mg/kg)	N/A
Particle Size	
Sand (%)	55
Silt (%)	33
Clay (%)	12

Legend:

# Value	- Criteria met
# Value	- Does not meet Criteria

Atlantic Richfield Representative: Mike McAnulty Date: 5-10-23

EPA Representative: NIKIA GREENE Digitally signed by NIKIA GREENE Date: 2023.06.12 07:47:39 -06'00' Date:

MT DEQ Representative: Date: 6/7/2023

BUTTE HILL COVER SOIL APPROVAL SUBMITTAL

5/6/2023

Source: ***Racetrack Borrow***
Sample #: ***14 - 23-ICS-0406-10***

Description		Specification		Sample	Specification Met: Yes	Specification Met: No
Chemical (mg/kg)						
	As	<	97	27.8	X	
	Cd	<	4	0.7	X	
	Cu	<	250	64.6	X	
	Hg	<	5	0.03	X	
	Pb	<	100	22.9	X	
	Zn	<	250	80.3	X	
pH (s.u.)		>	5.5	7.5	X	
		<	8.5			
SAR		<	12	0.90	X	
Saturation (%)		<	85	39.6	X	
		>	25			
EC (mmhos/cm)		<	4	2.4	X	
Textural Classification (USDA) <2.0 mm						
	Loam					
	Sandy loam				X	
	Sandy clay loam					
	Sandy clay					
	Clay loam					
	Silty clay					
	Silty clay loam					
	Silt loam					
	Silt					
	*Per EPA Approval (Loamy sand)					
Rock Content (%) (by volume)		<	45	5.8	X	

Other Information Requested	
Organic Matter (%)	
2.4	
Soil Nutrients	
N (mg/kg)	N/A
P (mg/kg)	N/A
K (mg/kg)	N/A
Particle Size	
Sand (%)	53
Silt (%)	36
Clay (%)	11

Legend:

# Value	- Criteria met
# Value	- Does not meet Criteria

Atlantic Richfield Representative: Mike McAnulty Date: 5-10-23

EPA Representative: NIKIA GREENE Digitally signed by NIKIA GREENE Date: 2023.06.12 07:50:25 -06'00' Date:

MT DEQ Representative: Date: 6/7/2023

BUTTE HILL COVER SOIL APPROVAL SUBMITTAL

5/6/2023

Source: ***Racetrack Borrow***
Sample #: ***15 - 23-ICS-0406-11***

Description		Specification		Sample	Specification Met: Yes	Specification Met: No
Chemical (mg/kg)						
	As	<	97	36.0	X	
	Cd	<	4	0.9	X	
	Cu	<	250	78.6	X	
	Hg	<	5	0.03	X	
	Pb	<	100	25.9	X	
	Zn	<	250	99.5	X	
pH (s.u.)		>	5.5	7.5	X	
		<	8.5			
SAR		<	12	0.82	X	
Saturation (%)		<	85	41.7	X	
		>	25			
EC (mmhos/cm)		<	4	2.4	X	
Textural Classification (USDA) <2.0 mm						
	Loam					
	Sandy loam				X	
	Sandy clay loam					
	Sandy clay					
	Clay loam					
	Silty clay					
	Silty clay loam					
	Silt loam					
	Silt					
	*Per EPA Approval (Loamy sand)					
Rock Content (%) (by volume)		<	45	9.4	X	

Other Information Requested		
Organic Matter (%)		
	2.4	
Soil Nutrients		
	N (mg/kg)	N/A
	P (mg/kg)	N/A
	K (mg/kg)	N/A
Particle Size		
	Sand (%)	55
	Silt (%)	33
	Clay (%)	12

Legend:

# Value	- Criteria met
# Value	- Does not meet Criteria

Atlantic Richfield Representative: Mike McAnulty Date: 5-10-23

EPA Representative: NIKIA GREENE Digitally signed by NIKIA GREENE Date: 2023.06.12 07:53:41 -06'00' Date:

MT DEQ Representative: Date: 6/7/2023

BUTTE HILL COVER SOIL APPROVAL SUBMITTAL

5/6/2023

Source: ***Racetrack Borrow***
Sample #: ***16 - 23-ICS-0406-12***

Description		Specification		Sample	Specification Met: Yes	Specification Met: No
Chemical (mg/kg)						
	As	<	97	32.0	X	
	Cd	<	4	0.8	X	
	Cu	<	250	71.4	X	
	Hg	<	5	0.03	X	
	Pb	<	100	22.7	X	
	Zn	<	250	101.0	X	
pH (s.u.)		>	5.5	7.5	X	
		<	8.5			
SAR		<	12	0.69	X	
Saturation (%)		<	85	37.3	X	
		>	25			
EC (mmhos/cm)		<	4	1.8	X	
Textural Classification (USDA) <2.0 mm						
	Loam					
	Sandy loam				X	
	Sandy clay loam					
	Sandy clay					
	Clay loam					
	Silty clay					
	Silty clay loam					
	Silt loam					
	Silt					
	*Per EPA Approval (Loamy sand)					
Rock Content (%) (by volume)		<	45	14.2	X	

Other Information Requested	
Organic Matter (%)	
2.1	
Soil Nutrients	
N (mg/kg)	N/A
P (mg/kg)	N/A
K (mg/kg)	N/A
Particle Size	
Sand (%)	57
Silt (%)	32
Clay (%)	11

Legend:

# Value	- Criteria met
# Value	- Does not meet Criteria

Atlantic Richfield Representative: Mike McAnulty Date: 5-10-23

EPA Representative: NIKIA GREENE Digitally signed by NIKIA GREENE Date: 2023.06.12 07:56:54 -06'00' Date:

MT DEQ Representative: Date: 6/7/2023

BUTTE HILL COVER SOIL APPROVAL SUBMITTAL

5/6/2023

Source: ***Racetrack Borrow***
Sample #: ***17 - 23-ICS-0406-13***

Description		Specification		Sample	Specification Met: Yes	Specification Met: No
Chemical (mg/kg)						
	As	<	97	35.5	X	
	Cd	<	4	0.8	X	
	Cu	<	250	67.2	X	
	Hg	<	5	0.02	X	
	Pb	<	100	22.9	X	
	Zn	<	250	86.0	X	
pH (s.u.)		>	5.5	7.4	X	
		<	8.5			
SAR		<	12	1.59	X	
Saturation (%)		<	85	30.2	X	
		>	25			
EC (mmhos/cm)		<	4	1.8	X	
Textural Classification (USDA) <2.0 mm						
	Loam					
	Sandy loam				X	
	Sandy clay loam					
	Sandy clay					
	Clay loam					
	Silty clay					
	Silty clay loam					
	Silt loam					
	Silt					
	*Per EPA Approval (Loamy sand)					
Rock Content (%) (by volume)		<	45	13.1	X	

Other Information Requested	
Organic Matter (%)	**1.9**
Soil Nutrients	
N (mg/kg)	N/A
P (mg/kg)	N/A
K (mg/kg)	N/A
Particle Size	
Sand (%)	66
Silt (%)	30
Clay (%)	4

Legend:

# Value	- Criteria met
# Value	- Does not meet Criteria

Atlantic Richfield Representative: Mike McAnulty Date: 5-10-23

EPA Representative: NIKIA GREENE Digitally signed by NIKIA GREENE Date: 2023.06.12 08:00:25 -06'00' Date:

MT DEQ Representative: Date: 6/7/2023

BUTTE HILL COVER SOIL APPROVAL SUBMITTAL

5/6/2023

Source: ***Racetrack Borrow***
Sample #: ***18 - 23-ICS-0406-14***

Description		Specification		Sample	Specification Met: Yes	Specification Met: No
Chemical (mg/kg)						
	As	<	97	38.8	X	
	Cd	<	4	1.0	X	
	Cu	<	250	75.3	X	
	Hg	<	5	0.03	X	
	Pb	<	100	25.0	X	
	Zn	<	250	93.5	X	
pH (s.u.)		>	5.5	7.5	X	
		<	8.5			
SAR		<	12	1.94	X	
Saturation (%)		<	85	31.1	X	
		>	25			
EC (mmhos/cm)		<	4	2.2	X	
Textural Classification (USDA) <2.0 mm						
	Loam					
	Sandy loam				X	
	Sandy clay loam					
	Sandy clay					
	Clay loam					
	Silty clay					
	Silty clay loam					
	Silt loam					
	Silt					
	*Per EPA Approval (Loamy sand)					
Rock Content (%) (by volume)		<	45	13.9	X	

Other Information Requested	
Organic Matter (%)	
2.0	
Soil Nutrients	
N (mg/kg)	N/A
P (mg/kg)	N/A
K (mg/kg)	N/A
Particle Size	
Sand (%)	68
Silt (%)	27
Clay (%)	5

Legend:

# Value	- Criteria met
# Value	- Does not meet Criteria

Atlantic Richfield Representative: Mike McAnulty Date: 5-10-23

EPA Representative: NIKIA GREENE Digitally signed by NIKIA GREENE Date: 2023.06.12 08:03:48 -06'00' Date:

MT DEQ Representative: Date: 6/7/2023

Attachment D-1

Racetrack Borrow 2021 Characterization
Data Lab Report

ANALYTICAL SUMMARY REPORT

December 08, 2021

Pioneer Technical Services
PO Box 3445
Butte, MT 59702-3445

Work Order: H21120031 Quote ID: H2070

Project Name: Race Track Topsoil/ICS

Energy Laboratories Inc Helena MT received the following 4 samples for Pioneer Technical Services on 12/1/2021 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
H21120031-001	Quadrant #1	11/30/21 10:20	12/01/21	Soil	Metals by ICP/ICPMS, Total Metals, NH4OAC Extractable Metals, Saturated Paste Coarse Fragments Conductivity, Saturated Paste Extract Mercury in Solid By CVAA Moisture Nitrate as N, KCL Extract Organic Carbon/Matter Walkley-Black pH, Saturated Paste Phosphorus-Olsen Total Metals Digestion by SW3050B Mercury Digestion by SW7471B KCL Soil Extract ASA33-3 NaHCO3 Soil Extract ASA24-5 Ammonium Acetate Extraction ASA13-3 Total Organic Matter Prep ASA29-3 Particle Size Analysis / Texture Prep ASA15-5 Saturated Paste Extraction ASA Particle Size Analysis / Texture Sodium Adsorption Ratio Saturation Percentage
H21120031-002	Quadrant #2	11/30/21 10:30	12/01/21	Soil	Same As Above
H21120031-003	Quadrant #3	11/30/21 10:40	12/01/21	Soil	Same As Above
H21120031-004	Quadrant #4	11/30/21 10:50	12/01/21	Soil	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 3161 E. Lyndale Ave., Helena, MT 59604, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager.

Report Approved By:

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Pioneer Technical Services
Client Sample ID: Quadrant #1
Project: Race Track Topsoil/ICS
Matrix: Soil

Lab ID: H21120031-001
Collection Date: 11/30/21 10:20
DateReceived: 12/01/21
Report Date: 12/08/21

Analyses	Result	Units	QUAL	RL	MCL	Method	Analysis Date / By	Prep Date	Prep Method	RunID	Run Order	BatchID
PHYSICAL CHARACTERISTICS												
Coarse Fragments	10	%		2		ASA15-3	12/08/21 08:39 / dma			MISC SOILS_211208A : 1		R170746
PHYSICAL CHARACTERISTICS												
Moisture	10.8	wt%		0.2		D2974	12/06/21 08:57 / dma			ORYING OVEN 2_211206E : 1		PMOIST_211206_A
Sand	48	%		1		ASA15-5	12/03/21 09:08 / sah	12/02/21 15:12	ASA15-5	HYDROMETER_211206A : 83		59300
Silt	30	%		1		ASA15-5	12/03/21 09:08 / sah	12/02/21 15:12	ASA15-5	HYDROMETER_211206A : 83		59300
Clay	22	%		1		ASA15-5	12/03/21 09:08 / sah	12/02/21 15:12	ASA15-5	HYDROMETER_211206A : 83		59300
Texture	L			1		ASA15-5	12/03/21 09:08 / sah	12/02/21 15:12	ASA15-5	HYDROMETER_211206A : 83		59300
SATURATED PASTE												
Saturation	52.8	%		0.1		USDA27a	12/03/21 08:34 / jjp	12/02/21 11:42	ASA	YING OVEN 2_211206C : 132		59302
SATURATED PASTE												
pH, sat. paste	7.6	s.u.		0.1		ASA10-3	12/03/21 08:40 / jjp	12/02/21 11:42	ASA	- ORION A211_211206A : 165		59302
SATURATED PASTE EXTRACT												
Conductivity, sat. paste	1.9	mmhos/cm		0.1		ASA10-3	12/03/21 16:12 / jjp	12/02/21 11:42	ASA	SOIL EC_211206A : 175		59302
Calcium, sat. paste	12.7	meq/L		0.05		SW6010B	12/04/21 00:26 / sld	12/02/21 11:42	ASA	ICP2-HE_211203A : 189		59302
Magnesium, sat. paste	4.01	meq/L		0.08		SW6010B	12/04/21 00:26 / sld	12/02/21 11:42	ASA	ICP2-HE_211203A : 189		59302
Sodium, sat. paste	4.01	meq/L		0.04		SW6010B	12/04/21 00:26 / sld	12/02/21 11:42	ASA	ICP2-HE_211203A : 189		59302
Sodium Adsorption Ratio (SAR)	1.4	unitless		0.1		USDA20b	12/06/21 09:22 / stp	12/02/21 11:42	ASA	SOIL CALC_211208A : 6		59302
CHEMICAL CHARACTERISTICS												
Potassium, Available	258	mg/kg	D	3		SW6010B	12/03/21 23:44 / sld	12/02/21 15:31	ASA13-3	ICP2-HE_211203A : 178		59299
Organic Matter	3.6	%		0.2		ASA29-3	12/08/21 08:43 / sah	12/02/21 15:28	ASA29-3	MISC SOILS_211208B : 6		59303
NUTRIENTS												
Phosphorus, Olsen	20	mg/kg-dry		1		ASA24-5	12/06/21 12:37 / GEM	12/02/21 15:30	ASA24-5	SEAL AA500_211206A : 20		59298
Nitrate as N, KCL Extract	1.7	mg/kg-dry		1.0		ASA33-8	12/06/21 10:48 / GEM	12/02/21 15:32	ASA33-3	FIA203-HE_211206A : 24		59304
3050 EXTRACTABLE METALS												
Arsenic	25	mg/kg		1		SW6020	12/03/21 11:27 / dck	12/02/21 08:25	SW3050 B	ICPMS205-H_211203B : 23		59329
Cadmium	ND	mg/kg		1		SW6020	12/03/21 11:27 / dck	12/02/21 08:25	SW3050 B	ICPMS205-H_211203B : 23		59329
Copper	67	mg/kg	D	3		SW6020	12/03/21 11:27 / dck	12/02/21 08:25	SW3050 B	ICPMS205-H_211203B : 23		59329
Lead	22	mg/kg		1		SW6020	12/03/21 11:27 / dck	12/02/21 08:25	SW3050 B	ICPMS205-H_211203B : 23		59329
Zinc	76	mg/kg	D	8		SW6020	12/03/21 11:27 / dck	12/02/21 08:25	SW3050 B	ICPMS205-H_211203B : 23		59329
METALS, TOTAL												
Mercury	ND	mg/kg		0.50		SW7471B	12/08/21 11:28 / dck	12/07/21 10:04	SW7471B	HGCV202-H_211208A : 18		59377

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
D - Reporting Limit (RL) increased due to sample matrix
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Pioneer Technical Services
Client Sample ID: Quadrant #2
Project: Race Track Topsoil/ICS
Matrix: Soil

Lab ID: H21120031-002
Collection Date: 11/30/21 10:30
DateReceived: 12/01/21
Report Date: 12/08/21

Analyses	Result	Units	QUAL	RL	MCL	Method	Analysis Date / By	Prep Date	Prep Method	RunID	Run Order	BatchID
PHYSICAL CHARACTERISTICS												
Coarse Fragments	9	%		2		ASA15-3	12/08/21 08:39 / dma			MISC SOILS_211208A : 2		R170746
PHYSICAL CHARACTERISTICS												
Moisture	6.3	wt%		0.2		D2974	12/06/21 08:57 / dma			ORYING OVEN 2_211206E : 3		PMOIST_211206_A
Sand	54	%		1		ASA15-5	12/03/21 09:08 / sah	12/02/21 15:12	ASA15-5	HYDROMETER_211206A : 84		59300
Silt	26	%		1		ASA15-5	12/03/21 09:08 / sah	12/02/21 15:12	ASA15-5	HYDROMETER_211206A : 84		59300
Clay	20	%		1		ASA15-5	12/03/21 09:08 / sah	12/02/21 15:12	ASA15-5	HYDROMETER_211206A : 84		59300
Texture	SCL			1		ASA15-5	12/03/21 09:08 / sah	12/02/21 15:12	ASA15-5	HYDROMETER_211206A : 84		59300
SATURATED PASTE												
Saturation	51.1	%		0.1		USDA27a	12/03/21 08:34 / jjp	12/02/21 11:42	ASA	YING OVEN 2_211206C : 133		59302
SATURATED PASTE												
pH, sat. paste	7.6	s.u.		0.1		ASA10-3	12/03/21 08:41 / jjp	12/02/21 11:42	ASA	- ORION A211_211206A : 166		59302
SATURATED PASTE EXTRACT												
Conductivity, sat. paste	1.0	mmhos/cm		0.1		ASA10-3	12/03/21 16:13 / jjp	12/02/21 11:42	ASA	SOIL EC_211206A : 176		59302
Calcium, sat. paste	6.91	meq/L		0.05		SW6010B	12/04/21 00:41 / sld	12/02/21 11:42	ASA	ICP2-HE_211203A : 193		59302
Magnesium, sat. paste	2.07	meq/L		0.08		SW6010B	12/04/21 00:41 / sld	12/02/21 11:42	ASA	ICP2-HE_211203A : 193		59302
Sodium, sat. paste	1.61	meq/L		0.04		SW6010B	12/04/21 00:41 / sld	12/02/21 11:42	ASA	ICP2-HE_211203A : 193		59302
Sodium Adsorption Ratio (SAR)	0.8	unitless		0.1		USDA20b	12/06/21 09:22 / stp	12/02/21 11:42	ASA	SOIL CALC_211208A : 7		59302
CHEMICAL CHARACTERISTICS												
Potassium, Available	197	mg/kg	D	3		SW6010B	12/03/21 23:48 / sld	12/02/21 15:31	ASA13-3	ICP2-HE_211203A : 179		59299
Organic Matter	4.5	%		0.2		ASA29-3	12/08/21 08:43 / sah	12/02/21 15:28	ASA29-3	MISC SOILS_211208B : 7		59303
NUTRIENTS												
Phosphorus, Olsen	46	mg/kg-dry		1		ASA24-5	12/06/21 12:38 / GEM	12/02/21 15:30	ASA24-5	SEAL AA500_211206A : 21		59298
Nitrate as N, KCL Extract	2.5	mg/kg-dry		1.0		ASA33-8	12/06/21 10:49 / GEM	12/02/21 15:32	ASA33-3	FIA203-HE_211206A : 25		59304
3050 EXTRACTABLE METALS												
Arsenic	37	mg/kg		1		SW6020	12/03/21 11:29 / dck	12/02/21 08:25	SW3050 B	ICPMS205-H_211203B : 24		59329
Cadmium	1	mg/kg		1		SW6020	12/03/21 11:29 / dck	12/02/21 08:25	SW3050 B	ICPMS205-H_211203B : 24		59329
Copper	86	mg/kg	D	3		SW6020	12/03/21 11:29 / dck	12/02/21 08:25	SW3050 B	ICPMS205-H_211203B : 24		59329
Lead	28	mg/kg		1		SW6020	12/03/21 11:29 / dck	12/02/21 08:25	SW3050 B	ICPMS205-H_211203B : 24		59329
Zinc	88	mg/kg	D	8		SW6020	12/03/21 11:29 / dck	12/02/21 08:25	SW3050 B	ICPMS205-H_211203B : 24		59329
METALS, TOTAL												
Mercury	ND	mg/kg		0.50		SW7471B	12/08/21 11:30 / dck	12/07/21 10:04	SW7471B	HGCV202-H_211208A : 19		59377

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
D - Reporting Limit (RL) increased due to sample matrix
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Pioneer Technical Services
Client Sample ID: Quadrant #3
Project: Race Track Topsoil/ICS
Matrix: Soil

Lab ID: H21120031-003
Collection Date: 11/30/21 10:40
DateReceived: 12/01/21
Report Date: 12/08/21

Analyses	Result	Units	QUAL	RL	MCL	Method	Analysis Date / By	Prep Date	Prep Method	RunID	Run Order	BatchID
PHYSICAL CHARACTERISTICS												
Coarse Fragments	11	%		2		ASA15-3	12/08/21 08:39 / dma			MISC SOILS_211208A	3	R170746
PHYSICAL CHARACTERISTICS												
Moisture	5.7	wt%		0.2		D2974	12/06/21 08:58 / dma			ORYING OVEN 2_211206E	5	PMOIST_211206_A
Sand	56	%		1		ASA15-5	12/03/21 09:08 / sah	12/02/21 15:12	ASA15-5	HYDROMETER_211206A	85	59300
Silt	26	%		1		ASA15-5	12/03/21 09:08 / sah	12/02/21 15:12	ASA15-5	HYDROMETER_211206A	85	59300
Clay	18	%		1		ASA15-5	12/03/21 09:08 / sah	12/02/21 15:12	ASA15-5	HYDROMETER_211206A	85	59300
Texture	SL			1		ASA15-5	12/03/21 09:08 / sah	12/02/21 15:12	ASA15-5	HYDROMETER_211206A	85	59300
SATURATED PASTE												
Saturation	40.8	%		0.1		USDA27a	12/03/21 08:34 / jjp	12/02/21 11:42	ASA	YING OVEN 2_211206C	134	59302
SATURATED PASTE												
pH, sat. paste	7.6	s.u.		0.1		ASA10-3	12/03/21 08:42 / jjp	12/02/21 11:42	ASA	- ORION A211_211206A	167	59302
SATURATED PASTE EXTRACT												
Conductivity, sat. paste	0.5	mmhos/cm		0.1		ASA10-3	12/03/21 16:14 / jjp	12/02/21 11:42	ASA	SOIL EC_211206A	177	59302
Calcium, sat. paste	3.50	meq/L		0.05		SW6010B	12/04/21 00:45 / sld	12/02/21 11:42	ASA	ICP2-HE_211203A	194	59302
Magnesium, sat. paste	1.10	meq/L		0.08		SW6010B	12/04/21 00:45 / sld	12/02/21 11:42	ASA	ICP2-HE_211203A	194	59302
Sodium, sat. paste	0.57	meq/L		0.04		SW6010B	12/04/21 00:45 / sld	12/02/21 11:42	ASA	ICP2-HE_211203A	194	59302
Sodium Adsorption Ratio (SAR)	0.4	unitless		0.1		USDA20b	12/06/21 09:22 / stp	12/02/21 11:42	ASA	SOIL CALC_211208A	8	59302
CHEMICAL CHARACTERISTICS												
Potassium, Available	262	mg/kg	D	3		SW6010B	12/03/21 23:52 / sld	12/02/21 15:31	ASA13-3	ICP2-HE_211203A	180	59299
Organic Matter	2.8	%		0.2		ASA29-3	12/08/21 08:43 / sah	12/02/21 15:28	ASA29-3	MISC SOILS_211208B	8	59303
NUTRIENTS												
Phosphorus, Olsen	39	mg/kg-dry		1		ASA24-5	12/06/21 12:41 / GEM	12/02/21 15:30	ASA24-5	SEAL AA500_211206A	23	59298
Nitrate as N, KCL Extract	1.8	mg/kg-dry		1.0		ASA33-8	12/06/21 10:50 / GEM	12/02/21 15:32	ASA33-3	FIA203-HE_211206A	26	59304
3050 EXTRACTABLE METALS												
Arsenic	30	mg/kg		1		SW6020	12/03/21 11:32 / dck	12/02/21 08:25	SW3050 B	ICPMS205-H_211203B	25	59329
Cadmium	ND	mg/kg		1		SW6020	12/03/21 11:32 / dck	12/02/21 08:25	SW3050 B	ICPMS205-H_211203B	25	59329
Copper	52	mg/kg	D	3		SW6020	12/03/21 11:32 / dck	12/02/21 08:25	SW3050 B	ICPMS205-H_211203B	25	59329
Lead	18	mg/kg		1		SW6020	12/03/21 11:32 / dck	12/02/21 08:25	SW3050 B	ICPMS205-H_211203B	25	59329
Zinc	64	mg/kg	D	8		SW6020	12/03/21 11:32 / dck	12/02/21 08:25	SW3050 B	ICPMS205-H_211203B	25	59329
METALS, TOTAL												
Mercury	ND	mg/kg		0.50		SW7471B	12/08/21 11:32 / dck	12/07/21 10:04	SW7471B	HGCV202-H_211208A	20	59377

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
D - Reporting Limit (RL) increased due to sample matrix
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Pioneer Technical Services
Client Sample ID: Quadrant #4
Project: Race Track Topsoil/ICS
Matrix: Soil

Lab ID: H21120031-004
Collection Date: 11/30/21 10:50
DateReceived: 12/01/21
Report Date: 12/08/21

Analyses	Result	Units	QUAL	RL	MCL	Method	Analysis Date / By	Prep Date	Prep Method	RunID	Run Order	BatchID
PHYSICAL CHARACTERISTICS												
Coarse Fragments	15	%		2		ASA15-3	12/08/21 08:39 / dma			MISC SOILS_211208A	4	R170746
PHYSICAL CHARACTERISTICS												
Moisture	4.0	wt%		0.2		D2974	12/06/21 08:58 / dma			ORYING OVEN 2_211206E	7	PMOIST_211206_A
Sand	62	%		1		ASA15-5	12/03/21 09:08 / sah	12/02/21 15:12	ASA15-5	HYDROMETER_211206A	87	59300
Silt	24	%		1		ASA15-5	12/03/21 09:08 / sah	12/02/21 15:12	ASA15-5	HYDROMETER_211206A	87	59300
Clay	14	%		1		ASA15-5	12/03/21 09:08 / sah	12/02/21 15:12	ASA15-5	HYDROMETER_211206A	87	59300
Texture	SL			1		ASA15-5	12/03/21 09:08 / sah	12/02/21 15:12	ASA15-5	HYDROMETER_211206A	87	59300
SATURATED PASTE												
Saturation	42.4	%		0.1		USDA27a	12/03/21 08:34 / jjp	12/02/21 11:42	ASA	YING OVEN 2_211206C	135	59302
SATURATED PASTE												
pH, sat. paste	7.3	s.u.		0.1		ASA10-3	12/03/21 08:43 / jjp	12/02/21 11:42	ASA	- ORION A211_211206A	168	59302
SATURATED PASTE EXTRACT												
Conductivity, sat. paste	1.3	mmhos/cm		0.1		ASA10-3	12/03/21 16:14 / jjp	12/02/21 11:42	ASA	SOIL EC_211206A	178	59302
Calcium, sat. paste	7.74	meq/L		0.05		SW6010B	12/04/21 00:48 / sld	12/02/21 11:42	ASA	ICP2-HE_211203A	195	59302
Magnesium, sat. paste	2.48	meq/L		0.08		SW6010B	12/04/21 00:48 / sld	12/02/21 11:42	ASA	ICP2-HE_211203A	195	59302
Sodium, sat. paste	3.89	meq/L		0.04		SW6010B	12/04/21 00:48 / sld	12/02/21 11:42	ASA	ICP2-HE_211203A	195	59302
Sodium Adsorption Ratio (SAR)	1.7	unitless		0.1		USDA20b	12/06/21 09:22 / stp	12/02/21 11:42	ASA	SOIL CALC_211208A	9	59302
CHEMICAL CHARACTERISTICS												
Potassium, Available	48	mg/kg	D	3		SW6010B	12/03/21 23:55 / sld	12/02/21 15:31	ASA13-3	ICP2-HE_211203A	181	59299
Organic Matter	2.6	%		0.2		ASA29-3	12/08/21 08:43 / sah	12/02/21 15:28	ASA29-3	MISC SOILS_211208B	10	59303
NUTRIENTS												
Phosphorus, Olsen	10	mg/kg-dry		1		ASA24-5	12/06/21 12:43 / GEM	12/02/21 15:30	ASA24-5	SEAL AA500_211206A	24	59298
Nitrate as N, KCL Extract	ND	mg/kg-dry		1.0		ASA33-8	12/06/21 12:02 / GEM	12/02/21 15:32	ASA33-3	FIA203-HE_211206A	49	59304
3050 EXTRACTABLE METALS												
Arsenic	38	mg/kg		1		SW6020	12/03/21 11:34 / dck	12/02/21 08:25	SW3050 B	ICPMS205-H_211203B	26	59329
Cadmium	ND	mg/kg		1		SW6020	12/03/21 11:34 / dck	12/02/21 08:25	SW3050 B	ICPMS205-H_211203B	26	59329
Copper	59	mg/kg	D	3		SW6020	12/03/21 11:34 / dck	12/02/21 08:25	SW3050 B	ICPMS205-H_211203B	26	59329
Lead	20	mg/kg		1		SW6020	12/03/21 11:34 / dck	12/02/21 08:25	SW3050 B	ICPMS205-H_211203B	26	59329
Zinc	76	mg/kg	D	8		SW6020	12/03/21 11:34 / dck	12/02/21 08:25	SW3050 B	ICPMS205-H_211203B	26	59329
METALS, TOTAL												
Mercury	ND	mg/kg		0.50		SW7471B	12/08/21 11:34 / dck	12/07/21 10:04	SW7471B	HGCV202-H_211208A	21	59377

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
D - Reporting Limit (RL) increased due to sample matrix
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services
Prepared by Helena, MT Branch
Work Order: H21120031
BatchID: 211202_1_COND-S-PAS
Date: *08-Dec-21*

Run ID :Run Order: **SOIL EC_211206A: 167** SampType: **Initial Calibration Verification Standard** Lab ID: **ICV_1_211202_1** Method: **ASA10-3**
Analysis Date: **12/03/21 16:07** Units: **mmhos/cm** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Conductivity, sat. paste	1.35	0.10	1.413	0	96	90	110				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **SOIL EC_211206A: 168** SampType: **Continuing Calibration Verification Standard** Lab ID: **CCV_1_211202_1** Method: **ASA10-3**
Analysis Date: **12/03/21 16:08** Units: **mmhos/cm** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Conductivity, sat. paste	4.89	0.10	5	0	98	90	110				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **SOIL EC_211206A: 169** SampType: **Continuing Calibration Verification Standard** Lab ID: **CCV1_1_211202_1** Method: **ASA10-3**
Analysis Date: **12/03/21 16:09** Units: **mmhos/cm** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Conductivity, sat. paste	0.905	0.10	1	0	90	90	110				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services
Prepared by Helena, MT Branch

Work Order: H21120031
BatchID: 211202_1_PH-S-PASTE
Date: *08-Dec-21*

Run ID :Run Order: **SOIL PH METER - ORION A211_21** SampType: **Initial Calibration Verification Standard** Lab ID: **ICV_1_211202_1** Method: **ASA10-3**

Analysis Date: **12/03/21 08:34** Units: **s.u.** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH, sat. paste	7.04	0.10	7	0	101	98.6	101.4				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **SOIL PH METER - ORION A211_21** SampType: **Continuing Calibration Verification Standard** Lab ID: **CCV_1_211202_1** Method: **ASA10-3**

Analysis Date: **12/03/21 08:35** Units: **s.u.** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH, sat. paste	7.04	0.10	7	0	101	98.6	101.4				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **SOIL PH METER - ORION A211_21** SampType: **Continuing Calibration Verification Standard** Lab ID: **CCV1_1_211202_1** Method: **ASA10-3**

Analysis Date: **12/03/21 08:36** Units: **s.u.** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH, sat. paste	4.02	0.10	4	0	100	97.5	102.5				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services
Prepared by Helena, MT Branch

Work Order: H21120031
BatchID: 211208sa-hg202
Date: *08-Dec-21*

Run ID :Run Order: **HGCV202-H_211208A: 8** SampType: **Initial Calibration Verification Standard** Lab ID: **ICV** Method: **SW7471B**

Analysis Date: **12/08/21 11:05** Units: **mg/kg** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.00097	0.50	0.001	0	97	90	110				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **HGCV202-H_211208A: 9** SampType: **Continuing Calibration Verification Standard** Lab ID: **CCV** Method: **SW7471B**

Analysis Date: **12/08/21 11:07** Units: **mg/kg** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.0024	0.50	0.0025	0	97	90	110				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **HGCV202-H_211208A: 10** SampType: **Continuing Calibration Blank** Lab ID: **CCB** Method: **SW7471B**

Analysis Date: **12/08/21 11:09** Units: **mg/kg** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	-6.5E-06	0.50		0							

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services
Prepared by Helena, MT Branch

Work Order: H21120031
BatchID: 59298
Date: *08-Dec-21*

Run ID :Run Order: **SEAL AA500_211206A: 12** SampType: **Method Blank** Lab ID: **MB-59298** Method: **ASA24-5**
Analysis Date: **12/06/21 12:25** Units: **mg/kg-dry** **Prep Info:** Prep Date: **12/1/2021** Prep Method: **ASA24-5**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus, Olsen	0.6	0.05									

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **SEAL AA500_211206A: 13** SampType: **Laboratory Control Sample** Lab ID: **LCS-59298** Method: **ASA24-5**
Analysis Date: **12/06/21 12:26** Units: **mg/kg-dry** **Prep Info:** Prep Date: **12/1/2021** Prep Method: **ASA24-5**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus, Olsen	53	1.0	43.97	0	122	70	130				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **SEAL AA500_211206A: 15** SampType: **Sample Matrix Spike** Lab ID: **H21110626-002AMS** Method: **ASA24-5**
Analysis Date: **12/06/21 12:29** Units: **mg/kg-dry** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus, Olsen	36	1.0	40	1.73	85	80	120				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **SEAL AA500_211206A: 22** SampType: **Sample Duplicate** Lab ID: **H21120031-002Adup** Method: **ASA24-5**
Analysis Date: **12/06/21 12:40** Units: **mg/kg-dry** **Prep Info:** Prep Date: **12/2/2021** Prep Method: **ASA24-5**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus, Olsen	43	1.0		0				45.96	6.6	30	

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services
Prepared by Helena, MT Branch

Work Order: H21120031
BatchID: 59299
Date: *08-Dec-21*

Run ID :Run Order: **ICP2-HE_211203A: 157** SampType: **Method Blank** Lab ID: **MB-59299** Method: **SW6010B**
Analysis Date: **12/03/21 22:24** Units: **mg/kg** **Prep Info:** Prep Date: **12/1/2021** Prep Method: **ASA13-3**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Potassium, Available	0.4	0.3									
Potassium, Extractable	0.001	0.0008									

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **ICP2-HE_211203A: 158** SampType: **Laboratory Fortified Blank** Lab ID: **LFB-59299** Method: **SW6010B**
Analysis Date: **12/03/21 22:28** Units: **mg/kg** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Potassium, Available	2800	3.2	2500	0	112	80	120				
Potassium, Extractable	7.18	0.0082	6.395	0	112	80	120				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **ICP2-HE_211203A: 159** SampType: **Laboratory Control Sample** Lab ID: **LCS-59299** Method: **SW6010B**
Analysis Date: **12/03/21 22:32** Units: **mg/kg** **Prep Info:** Prep Date: **12/1/2021** Prep Method: **ASA13-3**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Potassium, Available	660	3.1	653.1	0	101	70	130				
Potassium, Extractable	1.69	0.0080	1.672	0	101	70	130				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **ICP2-HE_211207B: 47** SampType: **Sample Matrix Spike** Lab ID: **H21110628-001AMS2** Method: **SW6010B**
Analysis Date: **12/07/21 14:07** Units: **mg/kg** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Potassium, Available	5610	6.4	5000	101.4	110	75	125				
Potassium, Extractable	14.4	0.016	12.79	0.2599	110	75	125				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **ICP2-HE_211207B: 48** SampType: **Sample Matrix Spike Duplicate** Lab ID: **H21110628-001AMSD2** Method: **SW6010B**
Analysis Date: **12/07/21 14:11** Units: **mg/kg** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Potassium, Available	6390	6.4	5000	101.4	126	75	125	5608	13	20	S
Potassium, Extractable	16.4	0.016	12.79	0.2599	126	75	125	14.38	13	20	S

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services
Prepared by Helena, MT Branch

Work Order: H21120031
BatchID: 59299
Date: *08-Dec-21*

Run ID :Run Order: **ICP2-HE_211207B: 48** SampType: **Sample Matrix Spike Duplicate** Lab ID: **H21110628-001AMSD2** Method: **SW6010B**

Analysis Date: **12/07/21 14:11** Units: **mg/kg** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **ICP2-HE_211207B: 67** SampType: **Sample Duplicate** Lab ID: **H21120031-004Adup** Method: **SW6010B**

Analysis Date: **12/07/21 15:23** Units: **mg/kg** **Prep Info:** Prep Date: **12/2/2021** Prep Method: **ASA13-3**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Potassium, Available	51.4	6.2		0				52.52	2.2	20	
Potassium, Extractable	0.132	0.016		0				0.1347	2.2	20	

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services
Prepared by Helena, MT Branch

Work Order: H21120031
BatchID: 59300
Date: *08-Dec-21*

Run ID :Run Order: **SOIL HYDROMETER_211206A: 86** SampType: **Sample Duplicate** Lab ID: **H21120031-003ADUP** Method: **ASA15-5**

Analysis Date: **12/03/21 09:08** Units: **%** **Prep Info:** Prep Date: **12/2/2021** Prep Method: **ASA15-5**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sand	58.0	1.0		0				56	3.5	20	
Silt	26.0	1.0		0				26	0.0	20	
Clay	16.0	1.0		0				18	12	20	
Texture	SL	1.0		0				0			

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **SOIL HYDROMETER_211206A: 88** SampType: **Laboratory Control Sample** Lab ID: **LCS-59300** Method: **ASA15-5**

Analysis Date: **12/03/21 09:08** Units: **%** **Prep Info:** Prep Date: **12/1/2021** Prep Method: **ASA15-5**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sand	48.0	1.0	42	0	114	70	130				
Silt	28.0	1.0	32	0	88	70	130				
Clay	24.0	1.0	26	0	92	70	130				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services
Prepared by Helena, MT Branch

Work Order: H21120031
BatchID: 59302
Date: *08-Dec-21*

Run ID :Run Order: **SOIL EC_211206A: 170** SampType: **Method Blank** Lab ID: **MB-59302** Method: **ASA10-3**
Analysis Date: **12/03/21 16:09** Units: **mmhos/cm** **Prep Info:** Prep Date: **12/1/2021** Prep Method: **ASA**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Conductivity, sat. paste	ND	0.05									

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **SOIL EC_211206A: 171** SampType: **Laboratory Control Sample** Lab ID: **LCS-59302** Method: **ASA10-3**
Analysis Date: **12/03/21 16:10** Units: **mmhos/cm** **Prep Info:** Prep Date: **12/1/2021** Prep Method: **ASA**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Conductivity, sat. paste	3.88	0.10	4.21	0	92	80	120				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **SOIL EC_211206A: 179** SampType: **Sample Duplicate** Lab ID: **H21120031-004ADUP** Method: **ASA10-3**
Analysis Date: **12/03/21 16:15** Units: **mmhos/cm** **Prep Info:** Prep Date: **12/2/2021** Prep Method: **ASA**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Conductivity, sat. paste	1.21	0.10		0				1.283	5.5	20	

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **SOIL PH METER - ORION A211_21** SampType: **Laboratory Control Sample** Lab ID: **LCS-59302** Method: **ASA10-3**
Analysis Date: **12/03/21 08:37** Units: **s.u.** **Prep Info:** Prep Date: **12/1/2021** Prep Method: **ASA**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH, sat. paste	8.03	0.10	8.042	0	100	95	105				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **SOIL PH METER - ORION A211_21** SampType: **Sample Duplicate** Lab ID: **H21120031-004ADUP** Method: **ASA10-3**
Analysis Date: **12/03/21 08:44** Units: **s.u.** **Prep Info:** Prep Date: **12/2/2021** Prep Method: **ASA**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH, sat. paste	7.27	0.10		0				7.26	0.1	20	

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services
Prepared by Helena, MT Branch

Work Order: H21120031 **BatchID: 59302** **Date:** *08-Dec-21*

Run ID :Run Order: **ICP2-HE_211203A: 184** SampType: **Method Blank** Lab ID: **MB-59302** Method: **SW6010B**

Analysis Date: **12/04/21 00:07** Units: **mg/L** **Prep Info:** Prep Date: **12/1/2021** Prep Method: **ASA**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	0.1									
Magnesium	ND	0.02									
Sodium	ND	0.02									
Calcium, sat. paste	ND	0.007									
Magnesium, sat. paste	ND	0.002									
Sodium, sat. paste	ND	0.0009									

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **ICP2-HE_211203A: 185** SampType: **Laboratory Fortified Blank** Lab ID: **LFB-59302** Method: **SW6010B**

Analysis Date: **12/04/21 00:11** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	47.5	1.0	50	0	95	80	120				
Magnesium	49.6	1.0	50	0	99	80	120				
Sodium	50.7	1.0	50	0	101	80	120				
Calcium, sat. paste	2.37	0.050	2.495	0	95	80	120				
Magnesium, sat. paste	4.08	0.082	4.115	0	99	80	120				
Sodium, sat. paste	2.20	0.043	2.175	0	101	80	120				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **ICP2-HE_211203A: 188** SampType: **Laboratory Control Sample** Lab ID: **LCS-59302** Method: **SW6010B**

Analysis Date: **12/04/21 00:22** Units: **mg/L** **Prep Info:** Prep Date: **12/1/2021** Prep Method: **ASA**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	196	1.0	217.6	0	90	70	130				
Magnesium	76.6	1.0	84.86	0	90	70	130				
Sodium	600	1.0	613	0	98	70	130				
Calcium, sat. paste	9.79	0.050	10.86	0	90	70	130				
Magnesium, sat. paste	6.31	0.082	6.984	0	90	70	130				
Sodium, sat. paste	26.1	0.043	26.65	0	98	70	130				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services
Prepared by Helena, MT Branch

Work Order: H21120031
BatchID: 59302
Date: *08-Dec-21*

Run ID :Run Order: **ICP2-HE_211203A: 191** SampType: **Sample Matrix Spike** Lab ID: **H21120031-001AMS2** Method: **SW6010B**

Analysis Date: **12/04/21 00:34** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	342	1.0	100	253.6	89	70	130				
Magnesium	147	1.0	100	48.7	98	70	130				
Sodium	188	1.0	100	92.18	96	70	130				
Calcium, sat. paste	17.1	0.050	4.99	12.65	89	70	130				
Magnesium, sat. paste	12.1	0.082	8.23	4.008	98	70	130				
Sodium, sat. paste	8.17	0.043	4.35	4.008	96	70	130				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **ICP2-HE_211203A: 192** SampType: **Sample Matrix Spike Duplicate** Lab ID: **H21120031-001AMSD2** Method: **SW6010B**

Analysis Date: **12/04/21 00:37** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	336	1.0	100	253.6	82	70	130	342.3	1.9	20	
Magnesium	148	1.0	100	48.7	99	70	130	146.8	0.6	20	
Sodium	193	1.0	100	92.18	101	70	130	187.8	2.7	20	
Calcium, sat. paste	16.8	0.050	4.99	12.65	82	70	130	17.08	1.9	20	
Magnesium, sat. paste	12.2	0.082	8.23	4.008	99	70	130	12.08	0.6	20	
Sodium, sat. paste	8.39	0.043	4.35	4.008	101	70	130	8.166	2.7	20	

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **ICP2-HE_211203A: 196** SampType: **Sample Duplicate** Lab ID: **H21120031-004Adup** Method: **SW6010B**

Analysis Date: **12/04/21 00:52** Units: **mg/L** **Prep Info:** Prep Date: **12/2/2021** Prep Method: **ASA**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	147	1.0		0				155.2	5.7	30	
Magnesium	28.2	1.0		0				30.08	6.5	30	
Sodium	84.9	1.0		0				89.38	5.1	30	
Calcium, sat. paste	7.31	0.050		0				7.745	5.7	30	
Magnesium, sat. paste	2.32	0.082		0				2.475	6.5	30	
Sodium, sat. paste	3.69	0.043		0				3.886	5.1	30	

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services
Prepared by Helena, MT Branch

Work Order: H21120031
BatchID: 59302
Date: *08-Dec-21*

Run ID :Run Order: **SOIL CALC_211208A: 10** SampType: **Sample Duplicate** Lab ID: **H21120031-004ADUP** Method: **USDA20b**

Analysis Date: **12/06/21 09:22** Units: **unitless** **Prep Info:** Prep Date: **12/2/2021** Prep Method: **ASA**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium Adsorption Ratio (SAR)	1.68	0.10		0				1.72	2.4	30	

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **SOIL CALC_211208A: 11** SampType: **Laboratory Control Sample** Lab ID: **LCS-59302** Method: **USDA20b**

Analysis Date: **12/06/21 09:22** Units: **unitless** **Prep Info:** Prep Date: **12/1/2021** Prep Method: **ASA**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium Adsorption Ratio (SAR)	9.20	0.10	8.798	0	105	80	120				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services
Prepared by Helena, MT Branch

Work Order: H21120031
BatchID: 59302
Date: *08-Dec-21*

Run ID :Run Order: **SOIL DRYING OVEN 2_211206C: 1** SampType: **Laboratory Control Sample** Lab ID: **LCS-59302** Method: **USDA27a**

Analysis Date: **12/03/21 08:33** Units: **%** **Prep Info:** Prep Date: **12/1/2021** Prep Method: **ASA**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Saturation	41.1	0.10	41.64	0	99	80	120				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **SOIL DRYING OVEN 2_211206C: 1** SampType: **Sample Duplicate** Lab ID: **H21120031-004ADUP** Method: **USDA27a**

Analysis Date: **12/03/21 08:34** Units: **%** **Prep Info:** Prep Date: **12/2/2021** Prep Method: **ASA**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Saturation	42.3	0.10		0				42.37	0.2	20	

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services
Prepared by Helena, MT Branch

Work Order: H21120031
BatchID: 59303
Date: *08-Dec-21*

Run ID :Run Order: **MISC SOILS_211208B: 1** SampType: **Laboratory Control Sample** Lab ID: **LCS-59303** Method: **ASA29-3**
Analysis Date: **12/08/21 08:43** Units: **%** **Prep Info:** Prep Date: **12/1/2021** Prep Method: **ASA29-3**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Matter	1.13	0.17	0.9762	0	116	70	130				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **MISC SOILS_211208B: 2** SampType: **Method Blank** Lab ID: **MB-59303** Method: **ASA29-3**
Analysis Date: **12/08/21 08:43** Units: **%** **Prep Info:** Prep Date: **12/1/2021** Prep Method: **ASA29-3**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Matter	ND	0.2									

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **MISC SOILS_211208B: 9** SampType: **Sample Duplicate** Lab ID: **H21120031-003ADUP** Method: **ASA29-3**
Analysis Date: **12/08/21 08:43** Units: **%** **Prep Info:** Prep Date: **12/2/2021** Prep Method: **ASA29-3**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Matter	2.77	0.17		0				2.806			

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services
Prepared by Helena, MT Branch

Work Order: H21120031
BatchID: 59304
Date: *08-Dec-21*

Run ID :Run Order: **FIA203-HE_211206A: 13** SampType: **Method Blank** Lab ID: **MB-59304** Method: **ASA33-8**
Analysis Date: **12/06/21 10:35** Units: **mg/kg-dry** **Prep Info:** Prep Date: **12/1/2021** Prep Method: **ASA33-3**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate as N, KCL Extract	0.4	0.1									

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **FIA203-HE_211206A: 14** SampType: **Laboratory Control Sample** Lab ID: **LCS-59304** Method: **ASA33-8**
Analysis Date: **12/06/21 10:36** Units: **mg/kg-dry** **Prep Info:** Prep Date: **12/1/2021** Prep Method: **ASA33-3**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate as N, KCL Extract	6.0	1.0	6.755	0	90	70	130				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **FIA203-HE_211206A: 16** SampType: **Sample Matrix Spike** Lab ID: **H21110608-001CMS** Method: **ASA33-8**
Analysis Date: **12/06/21 10:38** Units: **mg/kg-dry** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate as N, KCL Extract	5.4	1.0	5	1.104	85	80	120				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **FIA203-HE_211206A: 27** SampType: **Sample Duplicate** Lab ID: **H21120031-003ADUP** Method: **ASA33-8**
Analysis Date: **12/06/21 10:51** Units: **mg/kg-dry** **Prep Info:** Prep Date: **12/2/2021** Prep Method: **ASA33-3**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate as N, KCL Extract	1.8	1.0		0				1.83	1.0	30	

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services
Prepared by Helena, MT Branch

Work Order: H21120031 **BatchID: 59329** **Date:** *08-Dec-21*

Run ID :Run Order: **ICPMS205-H_211203B: 22** SampType: **Method Blank** Lab ID: **MB-59329** Method: **SW6020**

Analysis Date: **12/03/21 11:25** Units: **mg/kg** **Prep Info:** Prep Date: **12/2/2021** Prep Method: **SW3050 B**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.2									
Cadmium	ND	0.04									
Copper	ND	1									
Lead	ND	0.5									
Zinc	ND	3									

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **ICPMS205-H_211203B: 28** SampType: **Laboratory Control Sample** Lab ID: **LCS-59329** Method: **SW6020**

Analysis Date: **12/03/21 11:38** Units: **mg/kg** **Prep Info:** Prep Date: **12/2/2021** Prep Method: **SW3050 B**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	174	1.0	196	0	89	66.4	104				
Cadmium	104	1.0	99	0	105	79.2	121				
Copper	130	3.2	137	0	95	73.9	113				
Lead	109	1.3	105	0	104	71.6	128				
Zinc	248	7.7	231	0	107	83.1	125				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **ICPMS205-H_211203B: 29** SampType: **Laboratory Fortified Blank** Lab ID: **LFB-59329** Method: **SW6020**

Analysis Date: **12/03/21 11:40** Units: **mg/kg** **Prep Info:** Prep Date: **12/2/2021** Prep Method: **SW3050 B**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	55.6	1.0	50	0	111	80	120				
Cadmium	28.2	1.0	25	0	113	80	120				
Copper	55.0	3.2	50	0	110	80	120				
Lead	55.4	1.3	50	0	111	80	120				
Zinc	53.7	7.7	50	0	107	80	120				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **ICPMS205-H_211203B: 30** SampType: **Post Digestion/Distillation Spike** Lab ID: **H21120031-004APDS1** Method: **SW6020**

Analysis Date: **12/03/21 11:43** Units: **mg/kg** **Prep Info:** Prep Date: **12/2/2021** Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	49.6	1.0	12.38	38.34	91	75	125				

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services
Prepared by Helena, MT Branch

Work Order: H21120031
BatchID: 59329
Date: *08-Dec-21*

Run ID :Run Order: **ICPMS205-H_211203B: 30** SampType: **Post Digestion/Distillation Spike** Lab ID: **H21120031-004APDS1** Method: **SW6020**

Analysis Date: **12/03/21 11:43** Units: **mg/kg** **Prep Info:** Prep Date: **12/2/2021** Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	13.7	1.0	12.38	0.7257	105	75	125				
Copper	71.0	3.2	12.38	59.45		75	125				A
Lead	32.3	1.3	12.38	20.16	98	75	125				
Zinc	85.7	7.6	12.38	75.56		75	125				A

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **ICPMS205-H_211203B: 31** SampType: **Sample Matrix Spike** Lab ID: **H21120031-004AMS** Method: **SW6020**

Analysis Date: **12/03/21 11:45** Units: **mg/kg** **Prep Info:** Prep Date: **12/2/2021** Prep Method: **SW3050 B**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	83.7	1.0	49.85	38.34	91	75	125				
Cadmium	27.4	1.0	24.92	0.7257	107	75	125				
Copper	108	3.2	49.85	59.45	97	75	125				
Lead	73.9	1.3	49.85	20.16	108	75	125				
Zinc	116	7.7	49.85	75.56	82	75	125				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **ICPMS205-H_211203B: 32** SampType: **Sample Matrix Spike Duplicate** Lab ID: **H21120031-004AMSD** Method: **SW6020**

Analysis Date: **12/03/21 11:47** Units: **mg/kg** **Prep Info:** Prep Date: **12/2/2021** Prep Method: **SW3050 B**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	90.0	1.0	49.85	38.34	104	75	125	83.74	7.2	20	
Cadmium	28.5	1.0	24.92	0.7257	112	75	125	27.44	3.9	20	
Copper	113	3.2	49.85	59.45	108	75	125	107.6	5.3	20	
Lead	75.6	1.3	49.85	20.16	111	75	125	73.85	2.4	20	
Zinc	122	7.7	49.85	75.56	92	75	125	116.5	4.3	20	

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services — Prepared by Helena, MT Branch

Work Order: H21120031 **BatchID: 59377** **Date:** *08-Dec-21*

Run ID :Run Order: **HGCV202-H_211208A: 11** SampType: **Method Blank** Lab ID: **MB-59377** Method: **SW7471B**

Analysis Date: **12/08/21 11:13** Units: **mg/kg** **Prep Info:** Prep Date: **12/7/2021** Prep Method: **SW7471B**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	ND	0.005									

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **HGCV202-H_211208A: 12** SampType: **Laboratory Control Sample** Lab ID: **LCS-59377** Method: **SW7471B**

Analysis Date: **12/08/21 11:15** Units: **mg/kg** **Prep Info:** Prep Date: **12/7/2021** Prep Method: **SW7471B**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	6.0	0.50	5	0	120	71	126.4				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **HGCV202-H_211208A: 13** SampType: **Laboratory Fortified Blank** Lab ID: **LFB-59377** Method: **SW7471B**

Analysis Date: **12/08/21 11:17** Units: **mg/kg** **Prep Info:** Prep Date: **12/7/2021** Prep Method: **SW7471B**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.24	0.50	0.2	0	118	80	120				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **HGCV202-H_211208A: 23** SampType: **Sample Matrix Spike** Lab ID: **H21120031-004AMS** Method: **SW7471B**

Analysis Date: **12/08/21 11:38** Units: **mg/kg** **Prep Info:** Prep Date: **12/7/2021** Prep Method: **SW7471B**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.19	0.50	0.192	0.03642	81	80	120				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **HGCV202-H_211208A: 24** SampType: **Sample Matrix Spike Duplicate** Lab ID: **H21120031-004AMSD** Method: **SW7471B**

Analysis Date: **12/08/21 11:41** Units: **mg/kg** **Prep Info:** Prep Date: **12/7/2021** Prep Method: **SW7471B**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.23	0.050	0.188	0.03642	104	80	120	0.1913	19	20	

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services
Prepared by Helena, MT Branch

Work Order: H21120031
BatchID: PMOIST_211206_A
Date: *08-Dec-21*

Run ID :Run Order: **SOIL DRYING OVEN 2_211206E: 9** SampType: **Sample Duplicate** Lab ID: **H21120031-004A DUP** Method: **D2974**

Analysis Date: **12/06/21 08:58** Units: **wt%** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Moisture	3.79	0.20		0				4.05	6.6	20	

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services
Prepared by Helena, MT Branch

Work Order: H21120031
BatchID: R170658
Date: *08-Dec-21*

Run ID :Run Order: **ICP2-HE_211203A: 6** SampType: **Initial Calibration Verification Standard** Lab ID: **ICV** Method: **SW6010B**

Analysis Date: **12/03/21 09:12** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	39.5	1.0	40	0	99	90	110				
Magnesium	39.2	1.0	40	0	98	90	110				
Sodium	40.2	1.0	40	0	101	90	110				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **ICP2-HE_211203A: 7** SampType: **Continuing Calibration Verification Standard** Lab ID: **CCV** Method: **SW6010B**

Analysis Date: **12/03/21 09:16** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	24.6	1.0	25	0	98	90	110				
Magnesium	24.3	1.0	25	0	97	90	110				
Sodium	24.3	1.0	25	0	97	90	110				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **ICP2-HE_211203A: 8** SampType: **Continuing Calibration Blank** Lab ID: **ICB** Method: **SW6010B**

Analysis Date: **12/03/21 09:19** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	0.0340	1.0		0							
Magnesium	0.0139	1.0		0							
Sodium	0.00604	1.0		0							

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **ICP2-HE_211203A: 10** SampType: **Interference Check Sample A** Lab ID: **ICSA** Method: **SW6010B**

Analysis Date: **12/03/21 09:27** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	462	1.0	500	0	92	80	120				
Magnesium	418	1.0	500	0	84	80	120				
Sodium	0.0500	1.0		0		0	0				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services
Prepared by Helena, MT Branch

Work Order: H21120031
BatchID: R170658
Date: *08-Dec-21*

Run ID :Run Order: **ICP2-HE_211203A: 11** SampType: **Interference Check Sample AB** Lab ID: **ICSAB** Method: **SW6010B**

Analysis Date: **12/03/21 09:31** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	457	1.0	500	0	91	80	120				
Magnesium	421	1.0	500	0	84	80	120				
Sodium	19.6	1.0	20	0	98	80	120				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services
Prepared by Helena, MT Branch

Work Order: H21120031
BatchID: R170696
Date: *08-Dec-21*

Run ID :Run Order: **ICPMS205-H_211203B: 12** SampType: **Initial Calibration Verification Standard** Lab ID: **ICV** Method: **SW6020**

Analysis Date: **12/03/21 10:53** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.0626	0.0010	0.06	0	104	90	110				
Cadmium	0.0307	0.0010	0.03	0	102	90	110				
Copper	0.0612	0.0010	0.06	0	102	90	110				
Lead	0.0606	0.0010	0.06	0	101	90	110				
Zinc	0.0615	0.0013	0.06	0	102	90	110				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **ICPMS205-H_211203B: 15** SampType: **Interference Check Sample A** Lab ID: **ICSA** Method: **SW6020**

Analysis Date: **12/03/21 10:59** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.0000489	0.0010		0							
Cadmium	0.000176	0.0010		0							
Copper	-0.0000173	0.0010		0							
Lead	-0.0000104	0.0010		0							
Zinc	0.000951	0.0013		0							

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **ICPMS205-H_211203B: 17** SampType: **Interference Check Sample AB** Lab ID: **ICSAB** Method: **SW6020**

Analysis Date: **12/03/21 11:04** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.0109	0.0010	0.01	0	109	70	130				
Cadmium	0.0114	0.0010	0.01	0	114	70	130				
Copper	0.0219	0.0010	0.02	0	109	70	130				
Lead	6.94E-06	0.0010		0		0	0				
Zinc	0.0115	0.0013	0.01	0	115	70	130				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **ICPMS205-H_211203B: 20** SampType: **Continuing Calibration Verification Standard** Lab ID: **CCV** Method: **SW6020**

Analysis Date: **12/03/21 11:11** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.0524	0.0010	0.05	0	105	90	110				

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services
Prepared by Helena, MT Branch

Work Order: H21120031
BatchID: R170696
Date: *08-Dec-21*

Run ID :Run Order: **ICPMS205-H_211203B: 20** SampType: **Continuing Calibration Verification Standard** Lab ID: **CCV** Method: **SW6020**

Analysis Date: **12/03/21 11:11** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	0.0526	0.0010	0.05	0	105	90	110				
Copper	0.0520	0.0010	0.05	0	104	90	110				
Lead	0.0516	0.0010	0.05	0	103	90	110				
Zinc	0.0525	0.0013	0.05	0	105	90	110				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **ICPMS205-H_211203B: 21** SampType: **Continuing Calibration Blank** Lab ID: **CCB** Method: **SW6020**

Analysis Date: **12/03/21 11:13** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.0000355	0.0010		0							
Cadmium	0.0000331	0.0010		0							
Copper	0.0000880	0.0010		0							
Lead	0.0000205	0.0010		0							
Zinc	0.000259	0.0013		0							

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **ICPMS205-H_211203B: 61** SampType: **Initial Calibration Verification Standard** Lab ID: **ICV** Method: **SW6020**

Analysis Date: **12/03/21 14:49** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.0631	0.0010	0.06	0	105	90	110				
Cadmium	0.0319	0.0010	0.03	0	106	90	110				
Copper	0.0638	0.0010	0.06	0	106	90	110				
Lead	0.0612	0.0010	0.06	0	102	90	110				
Zinc	0.0640	0.0013	0.06	0	107	90	110				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **ICPMS205-H_211203B: 64** SampType: **Interference Check Sample A** Lab ID: **ICSA** Method: **SW6020**

Analysis Date: **12/03/21 14:56** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.0000381	0.0010		0							
Cadmium	0.000162	0.0010		0							

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services
Prepared by Helena, MT Branch
Work Order: H21120031
BatchID: R170696
Date: *08-Dec-21*

Run ID :Run Order: **ICPMS205-H_211203B: 64** SampType: **Interference Check Sample A** Lab ID: **ICSA** Method: **SW6020**
Analysis Date: **12/03/21 14:56** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	-0.0000932	0.0010		0							
Lead	2.09E-06	0.0010		0							
Zinc	0.000828	0.0013		0							

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **ICPMS205-H_211203B: 66** SampType: **Interference Check Sample AB** Lab ID: **ICSAB** Method: **SW6020**
Analysis Date: **12/03/21 15:00** Units: **mg/L** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.0110	0.0010	0.01	0	109	70	130				
Cadmium	0.0114	0.0010	0.01	0	114	70	130				
Copper	0.0219	0.0010	0.02	0	110	70	130				
Lead	0.0000129	0.0010		0		0	0				
Zinc	0.0105	0.0013	0.01	0	105	70	130				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services
Prepared by Helena, MT Branch

Work Order: H21120031
BatchID: R170697
Date: *08-Dec-21*

Run ID :Run Order: **FIA203-HE_211206A: 10** SampType: **Initial Calibration Verification Standard** Lab ID: **ICV** Method: **ASA33-8**

Analysis Date: **12/06/21 10:31** Units: **mg/kg-dry** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate as N, KCL Extract	0.95	1.0	1	0	95	90	110				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **FIA203-HE_211206A: 28** SampType: **Continuing Calibration Verification Standard** Lab ID: **CCV** Method: **ASA33-8**

Analysis Date: **12/06/21 10:53** Units: **mg/kg-dry** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate as N, KCL Extract	0.45	1.0	0.5	0	91	90	110				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **FIA203-HE_211206A: 29** SampType: **Continuing Calibration Blank** Lab ID: **CCB** Method: **ASA33-8**

Analysis Date: **12/06/21 10:54** Units: **mg/kg-dry** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate as N, KCL Extract	-0.0023	1.0		0							

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

ANALYTICAL QC SUMMARY REPORT

Client: Pioneer Technical Services
Prepared by Helena, MT Branch

Work Order: H21120031
BatchID: **R170700**
Date: *08-Dec-21*

Run ID :Run Order: **SEAL AA500_211206A: 27** SampType: **Continuing Calibration Verification Standard** Lab ID: **CCV** Method: **ASA24-5**

Analysis Date: **12/06/21 12:47** Units: **mg/kg-dry** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus, Olsen	2.5	1.0	2.5	0	99	85	115				

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Run ID :Run Order: **SEAL AA500_211206A: 28** SampType: **Continuing Calibration Blank** Lab ID: **CCB** Method: **ASA24-5**

Analysis Date: **12/06/21 12:49** Units: **mg/kg-dry** **Prep Info:** Prep Date: Prep Method:

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phosphorus, Olsen	0.026	1.0		0							

Associated samples: **H21120031-001A, H21120031-002A, H21120031-003A, H21120031-004A**

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limit
R - RPD outside accepted recovery limits
N - Analyte concentration was not sufficiently high to calculate RPD
A - Analyte concentration greater than four times the spike amount

Work Order Receipt Checklist

Pioneer Technical Services

H21120031

Login completed by: Skyler T. Pester
Date Received: 12/1/2021

Reviewed by: BL2000\spester
Received by: RAT

Reviewed Date: 12/8/2021
Carrier name: Hand Del

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☑	Not Applicable ☐
Container/Temp Blank temperature:	19.8°C No Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

Contact and Corrective Action Comments:

None

PIONEER TECHNICAL SERVICES, INC.

Chain of Custody

Company Name: Pioneer Technical Services	**Project Name:** Race Track Topsoil/ICS
Report Mail Address: 1101 S. Montana Street Butte, MT	**Project Contact Name, Phone, Fax, Email:** Dana St John (406) 490-5602 dstjohn@pioneer-technical.com H21120031
Invoice Address: 1101 S. Montana St. Butte, MT 59701	**Invoice Contact and Phone:** Dana St John, (406) 490-5602 dstjohn@pioneer-technical.com Purchase Order:

Comments: Please perform PH and metals analysis, and report to me before continuing with other analysis. Please add Mercury to metals.

Client ID	Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Sample Type	Atterberg Limits	Gradation	Proctor (STD, MOD)	Butte Hill Specs				SEE ATTACHED	Material Description	Normal Turnaround	RUSH Turnaround	Pioneer Lab No.
Race Track Topsoil /ICS	1 Quadrant #1	11-30-21	1020					X					Top soil		X	
	2 Quadrant #2	11-30-21	1030					X							X	
	3 Quadrant #3	11-30-21	1040					X							X	
	4 Quadrant #4	11-30-21	1050					X							X	
	5															
	6															

Custody Record MUST be Signed	Relinquished by: Patrick Lang	Date/Time: 12/1 13:24	Shipped by:	Received by: Date/Time:
	Relinquished by:	Date/Time:	Shipped by: hand 19.8° Nolic no TB no seals	Received by: 12-1-21 1324

Attachment D-2
Racetrack Borrow 2023 QA Data Lab Reports

ANALYTICAL SUMMARY REPORT

April 14, 2023

Pioneer Technical Services
307 E Park Ste 421
Anaconda, MT 59711-2300

Work Order: B23040585 Quote ID: B15569

Project Name: BPSOU Park Sampling

Energy Laboratories Inc Billings MT received the following 14 samples for Pioneer Technical Services on 4/11/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B23040585-001	23-ICS-0406-1	04/06/23 13:50	04/11/23	Soil	Metals, NH4OAC Extractable Metals, Saturated Paste Conductivity, Saturated Paste Extract Nitrate as N, KCL Extract Organic Carbon/Matter Walkley-Black pH, Saturated Paste Phosphorus-Olsen Ammonium Acetate Extraction ASA13-3 Saturated Paste Extraction ASA Particle Size Analysis / Texture Sodium Adsorption Ratio Saturation Percentage Sieve Analysis, Dry
B23040585-002	23-ICS-0406-2	04/06/23 13:55	04/11/23	Soil	Same As Above
B23040585-003	23-ICS-0406-3	04/06/23 14:00	04/11/23	Soil	Same As Above
B23040585-004	23-ICS-0406-4	04/06/23 14:05	04/11/23	Soil	Same As Above
B23040585-005	23-ICS-0406-5	04/06/23 14:10	04/11/23	Soil	Same As Above
B23040585-006	23-ICS-0406-6	04/06/23 14:15	04/11/23	Soil	Same As Above
B23040585-007	23-ICS-0406-7	04/06/23 14:20	04/11/23	Soil	Same As Above
B23040585-008	23-ICS-0406-8	04/06/23 14:25	04/11/23	Soil	Same As Above
B23040585-009	23-ICS-0406-9	04/06/23 14:30	04/11/23	Soil	Same As Above
B23040585-010	23-ICS-0406-10	04/06/23 14:35	04/11/23	Soil	Same As Above
B23040585-011	23-ICS-0406-11	04/06/23 14:40	04/11/23	Soil	Same As Above
B23040585-012	23-ICS-0406-12	04/06/23 14:45	04/11/23	Soil	Same As Above
B23040585-013	23-ICS-0406-13	04/06/23 14:50	04/11/23	Soil	Same As Above
B23040585-014	23-ICS-0406-14	04/06/23 14:55	04/11/23	Soil	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager.

ANALYTICAL SUMMARY REPORT

Report Approved By:

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Pioneer Technical Services
Project: BPSOU Park Sampling
Lab ID: B23040585-001
Client Sample ID: 23-ICS-0406-1

Report Date: 04/14/23
Collection Date: 04/06/23 13:50
DateReceived: 04/11/23
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Sand	56	%		1		ASA15-5	04/14/23 10:03 / srm
Silt	34	%		1		ASA15-5	04/14/23 10:03 / srm
Clay	10	%		1		ASA15-5	04/14/23 10:03 / srm
Texture	SL			1		ASA15-5	04/14/23 10:03 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE EXTRACT							
pH, sat. paste	7.1	s.u.		0.1		ASA10-3	04/14/23 10:00 / srm
Conductivity, sat. paste	1.2	mmhos/cm		0.1		ASA10-3	04/14/23 10:00 / srm
Saturation	36.9	%		0.1		USDA27a	04/14/23 10:00 / srm
Calcium, sat. paste	8.90	meq/L		0.05		SW6010B	04/13/23 20:59 / jpv
Magnesium, sat. paste	2.71	meq/L		0.08		SW6010B	04/13/23 20:59 / jpv
Sodium, sat. paste	0.89	meq/L		0.04		SW6010B	04/13/23 20:59 / jpv
Sodium Adsorption Ratio (SAR)	0.37	unitless		0.01		Calculation	04/14/23 14:40 / srm
CHEMICAL CHARACTERISTICS							
Organic Matter	2.1	%		0.2		ASA29-3	04/13/23 14:52 / trp
Phosphorus, Olsen	36	mg/kg		1		ASA24-5	04/14/23 13:27 / srm
Nitrate as N, KCL Extract	20	mg/kg		1		ASA33-8	04/13/23 16:50 / srm
SIEVE ANALYSIS							
1 in (25 mm), Retained	4.2	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
No. 10 (2 mm), Retained	9.0	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
Pan	86.7	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	250	mg/kg	D	3		SW6010B	04/13/23 18:11 / jpv

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
D - Reporting Limit (RL) increased due to sample matrix
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Pioneer Technical Services
Project: BPSOU Park Sampling
Lab ID: B23040585-002
Client Sample ID: 23-ICS-0406-2

Report Date: 04/14/23
Collection Date: 04/06/23 13:55
DateReceived: 04/11/23
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Sand	61	%		1		ASA15-5	04/14/23 10:03 / srm
Silt	30	%		1		ASA15-5	04/14/23 10:03 / srm
Clay	9	%		1		ASA15-5	04/14/23 10:03 / srm
Texture	SL			1		ASA15-5	04/14/23 10:03 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE EXTRACT							
pH, sat. paste	7.2	s.u.		0.1		ASA10-3	04/14/23 10:00 / srm
Conductivity, sat. paste	1.2	mmhos/cm		0.1		ASA10-3	04/14/23 10:00 / srm
Saturation	33.0	%		0.1		USDA27a	04/14/23 10:00 / srm
Calcium, sat. paste	8.23	meq/L		0.05		SW6010B	04/13/23 21:07 / jpv
Magnesium, sat. paste	2.65	meq/L		0.08		SW6010B	04/13/23 21:07 / jpv
Sodium, sat. paste	0.97	meq/L		0.04		SW6010B	04/13/23 21:07 / jpv
Sodium Adsorption Ratio (SAR)	0.42	unitless		0.01		Calculation	04/14/23 14:40 / srm
CHEMICAL CHARACTERISTICS							
Organic Matter	1.7	%		0.2		ASA29-3	04/13/23 14:52 / trp
Phosphorus, Olsen	34	mg/kg		1		ASA24-5	04/14/23 13:29 / srm
Nitrate as N, KCL Extract	23	mg/kg		1		ASA33-8	04/13/23 16:51 / srm
SIEVE ANALYSIS							
1 in (25 mm), Retained	< 0.1	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
No. 10 (2 mm), Retained	8.4	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
Pan	91.6	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	155	mg/kg	D	3		SW6010B	04/13/23 18:27 / jpv

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
D - Reporting Limit (RL) increased due to sample matrix
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Pioneer Technical Services
Project: BPSOU Park Sampling
Lab ID: B23040585-003
Client Sample ID: 23-ICS-0406-3

Report Date: 04/14/23
Collection Date: 04/06/23 14:00
DateReceived: 04/11/23
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Sand	65	%		1		ASA15-5	04/14/23 10:03 / srm
Silt	27	%		1		ASA15-5	04/14/23 10:03 / srm
Clay	8	%		1		ASA15-5	04/14/23 10:03 / srm
Texture	SL			1		ASA15-5	04/14/23 10:03 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE EXTRACT							
pH, sat. paste	7.1	s.u.		0.1		ASA10-3	04/14/23 10:00 / srm
Conductivity, sat. paste	0.8	mmhos/cm		0.1		ASA10-3	04/14/23 10:00 / srm
Saturation	27.1	%		0.1		USDA27a	04/14/23 10:00 / srm
Calcium, sat. paste	5.19	meq/L		0.05		SW6010B	04/13/23 21:15 / jpv
Magnesium, sat. paste	1.57	meq/L		0.08		SW6010B	04/13/23 21:15 / jpv
Sodium, sat. paste	0.91	meq/L		0.04		SW6010B	04/13/23 21:15 / jpv
Sodium Adsorption Ratio (SAR)	0.49	unitless		0.01		Calculation	04/14/23 14:40 / srm
CHEMICAL CHARACTERISTICS							
Organic Matter	1.2	%		0.2		ASA29-3	04/13/23 14:52 / trp
Phosphorus, Olsen	17	mg/kg		1		ASA24-5	04/14/23 13:34 / srm
Nitrate as N, KCL Extract	6	mg/kg		1		ASA33-8	04/13/23 16:59 / srm
SIEVE ANALYSIS							
1 in (25 mm), Retained	1.3	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
No. 10 (2 mm), Retained	11.8	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
Pan	87.0	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	232	mg/kg	D	3		SW6010B	04/13/23 18:35 / jpv

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
D - Reporting Limit (RL) increased due to sample matrix
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Pioneer Technical Services
Project: BPSOU Park Sampling
Lab ID: B23040585-004
Client Sample ID: 23-ICS-0406-4

Report Date: 04/14/23
Collection Date: 04/06/23 14:05
DateReceived: 04/11/23
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Sand	63	%		1		ASA15-5	04/14/23 10:03 / srm
Silt	29	%		1		ASA15-5	04/14/23 10:03 / srm
Clay	8	%		1		ASA15-5	04/14/23 10:03 / srm
Texture	SL			1		ASA15-5	04/14/23 10:03 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE EXTRACT							
pH, sat. paste	7.4	s.u.		0.1		ASA10-3	04/14/23 10:00 / srm
Conductivity, sat. paste	2.4	mmhos/cm		0.1		ASA10-3	04/14/23 10:00 / srm
Saturation	32.6	%		0.1		USDA27a	04/14/23 10:00 / srm
Calcium, sat. paste	9.29	meq/L	D	0.07		SW6010B	04/13/23 21:19 / jpv
Magnesium, sat. paste	3.57	meq/L		0.08		SW6010B	04/13/23 21:19 / jpv
Sodium, sat. paste	2.93	meq/L	D	0.07		SW6010B	04/13/23 21:19 / jpv
Sodium Adsorption Ratio (SAR)	1.15	unitless		0.01		Calculation	04/14/23 14:40 / srm
CHEMICAL CHARACTERISTICS							
Organic Matter	2.2	%		0.2		ASA29-3	04/13/23 14:52 / trp
Phosphorus, Olsen	62	mg/kg		1		ASA24-5	04/14/23 13:36 / srm
Nitrate as N, KCL Extract	44	mg/kg	D	3		ASA33-8	04/13/23 17:14 / srm
SIEVE ANALYSIS							
1 in (25 mm), Retained	< 0.1	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
No. 10 (2 mm), Retained	9.8	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
Pan	90.2	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	1240	mg/kg	D	3		SW6010B	04/13/23 18:39 / jpv

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
D - Reporting Limit (RL) increased due to sample matrix
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Pioneer Technical Services
Project: BPSOU Park Sampling
Lab ID: B23040585-005
Client Sample ID: 23-ICS-0406-5

Report Date: 04/14/23
Collection Date: 04/06/23 14:10
DateReceived: 04/11/23
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Sand	54	%		1		ASA15-5	04/14/23 10:03 / srm
Silt	36	%		1		ASA15-5	04/14/23 10:03 / srm
Clay	10	%		1		ASA15-5	04/14/23 10:03 / srm
Texture	SL			1		ASA15-5	04/14/23 10:03 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE EXTRACT							
pH, sat. paste	7.3	s.u.		0.1		ASA10-3	04/14/23 10:00 / srm
Conductivity, sat. paste	1.4	mmhos/cm		0.1		ASA10-3	04/14/23 10:00 / srm
Saturation	38.3	%		0.1		USDA27a	04/14/23 10:00 / srm
Calcium, sat. paste	10.7	meq/L		0.05		SW6010B	04/13/23 21:23 / jpv
Magnesium, sat. paste	2.94	meq/L		0.08		SW6010B	04/13/23 21:23 / jpv
Sodium, sat. paste	1.16	meq/L		0.04		SW6010B	04/13/23 21:23 / jpv
Sodium Adsorption Ratio (SAR)	0.44	unitless		0.01		Calculation	04/14/23 14:40 / srm
CHEMICAL CHARACTERISTICS							
Organic Matter	2.8	%		0.2		ASA29-3	04/13/23 14:52 / trp
Phosphorus, Olsen	38	mg/kg		1		ASA24-5	04/14/23 13:38 / srm
Nitrate as N, KCL Extract	36	mg/kg	D	3		ASA33-8	04/13/23 17:14 / srm
SIEVE ANALYSIS							
1 in (25 mm), Retained	< 0.1	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
No. 10 (2 mm), Retained	7.9	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
Pan	92.1	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	233	mg/kg	D	3		SW6010B	04/13/23 18:44 / jpv

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
D - Reporting Limit (RL) increased due to sample matrix
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Pioneer Technical Services
Project: BPSOU Park Sampling
Lab ID: B23040585-006
Client Sample ID: 23-ICS-0406-6

Report Date: 04/14/23
Collection Date: 04/06/23 14:15
DateReceived: 04/11/23
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Sand	61	%		1		ASA15-5	04/14/23 10:03 / srm
Silt	30	%		1		ASA15-5	04/14/23 10:03 / srm
Clay	9	%		1		ASA15-5	04/14/23 10:03 / srm
Texture	SL			1		ASA15-5	04/14/23 10:03 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE EXTRACT							
pH, sat. paste	7.4	s.u.		0.1		ASA10-3	04/14/23 10:00 / srm
Conductivity, sat. paste	1.5	mmhos/cm		0.1		ASA10-3	04/14/23 10:00 / srm
Saturation	33.7	%		0.1		USDA27a	04/14/23 10:00 / srm
Calcium, sat. paste	11.2	meq/L		0.05		SW6010B	04/13/23 21:27 / jpv
Magnesium, sat. paste	3.29	meq/L		0.08		SW6010B	04/13/23 21:27 / jpv
Sodium, sat. paste	1.13	meq/L		0.04		SW6010B	04/13/23 21:27 / jpv
Sodium Adsorption Ratio (SAR)	0.42	unitless		0.01		Calculation	04/14/23 14:40 / srm
CHEMICAL CHARACTERISTICS							
Organic Matter	2.2	%		0.2		ASA29-3	04/13/23 14:52 / trp
Phosphorus, Olsen	40	mg/kg		1		ASA24-5	04/14/23 13:43 / srm
Nitrate as N, KCL Extract	30	mg/kg	D	3		ASA33-8	04/13/23 17:15 / srm
SIEVE ANALYSIS							
1 in (25 mm), Retained	2.0	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
No. 10 (2 mm), Retained	5.7	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
Pan	92.3	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	196	mg/kg	D	3		SW6010B	04/13/23 18:48 / jpv

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
D - Reporting Limit (RL) increased due to sample matrix
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Pioneer Technical Services
Project: BPSOU Park Sampling
Lab ID: B23040585-007
Client Sample ID: 23-ICS-0406-7

Report Date: 04/14/23
Collection Date: 04/06/23 14:20
DateReceived: 04/11/23
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Sand	57	%		1		ASA15-5	04/14/23 10:03 / srm
Silt	33	%		1		ASA15-5	04/14/23 10:03 / srm
Clay	10	%		1		ASA15-5	04/14/23 10:03 / srm
Texture	SL			1		ASA15-5	04/14/23 10:03 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE EXTRACT							
pH, sat. paste	7.3	s.u.		0.1		ASA10-3	04/14/23 10:00 / srm
Conductivity, sat. paste	3.6	mmhos/cm		0.1		ASA10-3	04/14/23 10:00 / srm
Saturation	36.9	%		0.1		USDA27a	04/14/23 10:00 / srm
Calcium, sat. paste	24.7	meq/L	D	0.07		SW6010B	04/13/23 21:40 / jpv
Magnesium, sat. paste	7.83	meq/L		0.08		SW6010B	04/13/23 21:40 / jpv
Sodium, sat. paste	5.79	meq/L	D	0.07		SW6010B	04/13/23 21:40 / jpv
Sodium Adsorption Ratio (SAR)	1.44	unitless		0.01		Calculation	04/14/23 14:40 / srm
CHEMICAL CHARACTERISTICS							
Organic Matter	2.4	%		0.2		ASA29-3	04/13/23 14:52 / trp
Phosphorus, Olsen	35	mg/kg		1		ASA24-5	04/14/23 13:45 / srm
Nitrate as N, KCL Extract	28	mg/kg		1		ASA33-8	04/13/23 17:03 / srm
SIEVE ANALYSIS							
1 in (25 mm), Retained	< 0.1	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
No. 10 (2 mm), Retained	7.6	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
Pan	92.4	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	197	mg/kg	D	3		SW6010B	04/13/23 18:52 / jpv

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
D - Reporting Limit (RL) increased due to sample matrix
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Pioneer Technical Services
Project: BPSOU Park Sampling
Lab ID: B23040585-008
Client Sample ID: 23-ICS-0406-8

Report Date: 04/14/23
Collection Date: 04/06/23 14:25
DateReceived: 04/11/23
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Sand	64	%		1		ASA15-5	04/14/23 10:03 / srm
Silt	27	%		1		ASA15-5	04/14/23 10:03 / srm
Clay	9	%		1		ASA15-5	04/14/23 10:03 / srm
Texture	SL			1		ASA15-5	04/14/23 10:03 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE EXTRACT							
pH, sat. paste	7.4	s.u.		0.1		ASA10-3	04/14/23 10:00 / srm
Conductivity, sat. paste	2.0	mmhos/cm		0.1		ASA10-3	04/14/23 10:00 / srm
Saturation	35.3	%		0.1		USDA27a	04/14/23 10:00 / srm
Calcium, sat. paste	15.2	meq/L		0.05		SW6010B	04/13/23 21:44 / jpv
Magnesium, sat. paste	4.33	meq/L		0.08		SW6010B	04/13/23 21:44 / jpv
Sodium, sat. paste	2.52	meq/L		0.04		SW6010B	04/13/23 21:44 / jpv
Sodium Adsorption Ratio (SAR)	0.81	unitless		0.01		Calculation	04/14/23 14:40 / srm
CHEMICAL CHARACTERISTICS							
Organic Matter	2.3	%		0.2		ASA29-3	04/13/23 14:52 / trp
Phosphorus, Olsen	37	mg/kg		1		ASA24-5	04/14/23 13:46 / srm
Nitrate as N, KCL Extract	27	mg/kg		1		ASA33-8	04/13/23 17:03 / srm
SIEVE ANALYSIS							
1 in (25 mm), Retained	< 0.1	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
No. 10 (2 mm), Retained	9.9	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
Pan	90.1	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	217	mg/kg	D	3		SW6010B	04/13/23 18:56 / jpv

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
D - Reporting Limit (RL) increased due to sample matrix
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Pioneer Technical Services
Project: BPSOU Park Sampling
Lab ID: B23040585-009
Client Sample ID: 23-ICS-0406-9

Report Date: 04/14/23
Collection Date: 04/06/23 14:30
DateReceived: 04/11/23
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Sand	55	%		1		ASA15-5	04/14/23 10:03 / srm
Silt	33	%		1		ASA15-5	04/14/23 10:03 / srm
Clay	12	%		1		ASA15-5	04/14/23 10:03 / srm
Texture	SL			1		ASA15-5	04/14/23 10:03 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE EXTRACT							
pH, sat. paste	7.3	s.u.		0.1		ASA10-3	04/14/23 10:00 / srm
Conductivity, sat. paste	2.9	mmhos/cm		0.1		ASA10-3	04/14/23 10:00 / srm
Saturation	43.9	%		0.1		USDA27a	04/14/23 10:00 / srm
Calcium, sat. paste	19.9	meq/L	D	0.07		SW6010B	04/13/23 21:48 / jpv
Magnesium, sat. paste	5.82	meq/L		0.08		SW6010B	04/13/23 21:48 / jpv
Sodium, sat. paste	4.04	meq/L	D	0.07		SW6010B	04/13/23 21:48 / jpv
Sodium Adsorption Ratio (SAR)	1.13	unitless		0.01		Calculation	04/14/23 14:40 / srm
CHEMICAL CHARACTERISTICS							
Organic Matter	2.8	%		0.2		ASA29-3	04/13/23 14:52 / trp
Phosphorus, Olsen	32	mg/kg		1		ASA24-5	04/14/23 13:48 / srm
Nitrate as N, KCL Extract	30	mg/kg		1		ASA33-8	04/13/23 17:04 / srm
SIEVE ANALYSIS							
1 in (25 mm), Retained	2.6	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
No. 10 (2 mm), Retained	6.5	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
Pan	90.9	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	229	mg/kg	D	3		SW6010B	04/13/23 19:00 / jpv

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
D - Reporting Limit (RL) increased due to sample matrix
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Pioneer Technical Services
Project: BPSOU Park Sampling
Lab ID: B23040585-010
Client Sample ID: 23-ICS-0406-10

Report Date: 04/14/23
Collection Date: 04/06/23 14:35
DateReceived: 04/11/23
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Sand	53	%		1		ASA15-5	04/14/23 10:03 / srm
Silt	36	%		1		ASA15-5	04/14/23 10:03 / srm
Clay	11	%		1		ASA15-5	04/14/23 10:03 / srm
Texture	SL			1		ASA15-5	04/14/23 10:03 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE EXTRACT							
pH, sat. paste	7.5	s.u.		0.1		ASA10-3	04/14/23 10:00 / srm
Conductivity, sat. paste	2.4	mmhos/cm		0.1		ASA10-3	04/14/23 10:00 / srm
Saturation	39.6	%		0.1		USDA27a	04/14/23 10:00 / srm
Calcium, sat. paste	16.6	meq/L	D	0.07		SW6010B	04/13/23 21:52 / jpv
Magnesium, sat. paste	4.65	meq/L		0.08		SW6010B	04/13/23 21:52 / jpv
Sodium, sat. paste	2.93	meq/L	D	0.07		SW6010B	04/13/23 21:52 / jpv
Sodium Adsorption Ratio (SAR)	0.90	unitless		0.01		Calculation	04/14/23 14:40 / srm
CHEMICAL CHARACTERISTICS							
Organic Matter	2.4	%		0.2		ASA29-3	04/13/23 14:52 / trp
Phosphorus, Olsen	31	mg/kg		1		ASA24-5	04/14/23 13:50 / srm
Nitrate as N, KCL Extract	22	mg/kg		1		ASA33-8	04/13/23 17:05 / srm
SIEVE ANALYSIS							
1 in (25 mm), Retained	< 0.1	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
No. 10 (2 mm), Retained	5.8	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
Pan	94.2	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	157	mg/kg	D	3		SW6010B	04/13/23 20:00 / jpv

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
D - Reporting Limit (RL) increased due to sample matrix
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Pioneer Technical Services
Project: BPSOU Park Sampling
Lab ID: B23040585-011
Client Sample ID: 23-ICS-0406-11

Report Date: 04/14/23
Collection Date: 04/06/23 14:40
DateReceived: 04/11/23
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Sand	55	%		1		ASA15-5	04/14/23 10:03 / srm
Silt	33	%		1		ASA15-5	04/14/23 10:03 / srm
Clay	12	%		1		ASA15-5	04/14/23 10:03 / srm
Texture	SL			1		ASA15-5	04/14/23 10:03 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE EXTRACT							
pH, sat. paste	7.5	s.u.		0.1		ASA10-3	04/14/23 10:00 / srm
Conductivity, sat. paste	2.4	mmhos/cm		0.1		ASA10-3	04/14/23 10:00 / srm
Saturation	41.7	%		0.1		USDA27a	04/14/23 10:00 / srm
Calcium, sat. paste	16.1	meq/L	D	0.07		SW6010B	04/13/23 21:56 / jpv
Magnesium, sat. paste	4.75	meq/L		0.08		SW6010B	04/13/23 21:56 / jpv
Sodium, sat. paste	2.64	meq/L	D	0.07		SW6010B	04/13/23 21:56 / jpv
Sodium Adsorption Ratio (SAR)	0.82	unitless		0.01		Calculation	04/14/23 14:40 / srm
CHEMICAL CHARACTERISTICS							
Organic Matter	2.4	%		0.2		ASA29-3	04/13/23 14:52 / trp
Phosphorus, Olsen	30	mg/kg		1		ASA24-5	04/14/23 13:55 / srm
Nitrate as N, KCL Extract	51	mg/kg	D	3		ASA33-8	04/13/23 17:15 / srm
SIEVE ANALYSIS							
1 in (25 mm), Retained	< 0.1	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
No. 10 (2 mm), Retained	9.4	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
Pan	90.6	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	213	mg/kg	D	3		SW6010B	04/13/23 20:05 / jpv

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
D - Reporting Limit (RL) increased due to sample matrix
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Pioneer Technical Services
Project: BPSOU Park Sampling
Lab ID: B23040585-012
Client Sample ID: 23-ICS-0406-12

Report Date: 04/14/23
Collection Date: 04/06/23 14:45
DateReceived: 04/11/23
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Sand	57	%		1		ASA15-5	04/14/23 10:03 / srm
Silt	32	%		1		ASA15-5	04/14/23 10:03 / srm
Clay	11	%		1		ASA15-5	04/14/23 10:03 / srm
Texture	SL			1		ASA15-5	04/14/23 10:03 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE EXTRACT							
pH, sat. paste	7.5	s.u.		0.1		ASA10-3	04/14/23 10:00 / srm
Conductivity, sat. paste	1.8	mmhos/cm		0.1		ASA10-3	04/14/23 10:00 / srm
Saturation	37.3	%		0.1		USDA27a	04/14/23 10:00 / srm
Calcium, sat. paste	12.7	meq/L		0.05		SW6010B	04/13/23 22:05 / jpv
Magnesium, sat. paste	3.91	meq/L		0.08		SW6010B	04/13/23 22:05 / jpv
Sodium, sat. paste	1.98	meq/L		0.04		SW6010B	04/13/23 22:05 / jpv
Sodium Adsorption Ratio (SAR)	0.69	unitless		0.01		Calculation	04/14/23 14:40 / srm
CHEMICAL CHARACTERISTICS							
Organic Matter	2.1	%		0.2		ASA29-3	04/13/23 14:52 / trp
Phosphorus, Olsen	26	mg/kg		1		ASA24-5	04/14/23 13:57 / srm
Nitrate as N, KCL Extract	33	mg/kg		1		ASA33-8	04/13/23 17:07 / srm
SIEVE ANALYSIS							
1 in (25 mm), Retained	4.4	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
No. 10 (2 mm), Retained	14.2	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
Pan	81.4	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	169	mg/kg	D	3		SW6010B	04/13/23 20:13 / jpv

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
D - Reporting Limit (RL) increased due to sample matrix
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Pioneer Technical Services
Project: BPSOU Park Sampling
Lab ID: B23040585-013
Client Sample ID: 23-ICS-0406-13

Report Date: 04/14/23
Collection Date: 04/06/23 14:50
DateReceived: 04/11/23
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Sand	66	%		1		ASA15-5	04/14/23 10:03 / srm
Silt	30	%		1		ASA15-5	04/14/23 10:03 / srm
Clay	4	%		1		ASA15-5	04/14/23 10:03 / srm
Texture	SL			1		ASA15-5	04/14/23 10:03 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE EXTRACT							
pH, sat. paste	7.4	s.u.		0.1		ASA10-3	04/14/23 10:00 / srm
Conductivity, sat. paste	1.8	mmhos/cm		0.1		ASA10-3	04/14/23 10:00 / srm
Saturation	30.2	%		0.1		USDA27a	04/14/23 10:00 / srm
Calcium, sat. paste	12.2	meq/L		0.05		SW6010B	04/13/23 22:13 / jpv
Magnesium, sat. paste	3.48	meq/L		0.08		SW6010B	04/13/23 22:13 / jpv
Sodium, sat. paste	4.46	meq/L		0.04		SW6010B	04/13/23 22:13 / jpv
Sodium Adsorption Ratio (SAR)	1.59	unitless		0.01		Calculation	04/14/23 14:40 / srm
CHEMICAL CHARACTERISTICS							
Organic Matter	1.9	%		0.2		ASA29-3	04/13/23 14:52 / trp
Phosphorus, Olsen	16	mg/kg		1		ASA24-5	04/14/23 13:59 / srm
Nitrate as N, KCL Extract	18	mg/kg		1		ASA33-8	04/13/23 17:08 / srm
SIEVE ANALYSIS							
1 in (25 mm), Retained	< 0.1	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
No. 10 (2 mm), Retained	13.1	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
Pan	86.9	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	87	mg/kg	D	3		SW6010B	04/13/23 20:21 / jpv

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
D - Reporting Limit (RL) increased due to sample matrix
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Pioneer Technical Services
Project: BPSOU Park Sampling
Lab ID: B23040585-014
Client Sample ID: 23-ICS-0406-14

Report Date: 04/14/23
Collection Date: 04/06/23 14:55
DateReceived: 04/11/23
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Sand	68	%		1		ASA15-5	04/14/23 10:03 / srm
Silt	27	%		1		ASA15-5	04/14/23 10:03 / srm
Clay	5	%		1		ASA15-5	04/14/23 10:03 / srm
Texture	SL			1		ASA15-5	04/14/23 10:03 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE EXTRACT							
pH, sat. paste	7.5	s.u.		0.1		ASA10-3	04/14/23 10:00 / srm
Conductivity, sat. paste	2.2	mmhos/cm		0.1		ASA10-3	04/14/23 10:00 / srm
Saturation	31.1	%		0.1		USDA27a	04/14/23 10:00 / srm
Calcium, sat. paste	14.0	meq/L	D	0.07		SW6010B	04/13/23 22:17 / jpv
Magnesium, sat. paste	4.20	meq/L		0.08		SW6010B	04/13/23 22:17 / jpv
Sodium, sat. paste	5.86	meq/L	D	0.07		SW6010B	04/13/23 22:17 / jpv
Sodium Adsorption Ratio (SAR)	1.94	unitless		0.01		Calculation	04/14/23 14:40 / srm
CHEMICAL CHARACTERISTICS							
Organic Matter	2.0	%		0.2		ASA29-3	04/13/23 14:52 / trp
Phosphorus, Olsen	19	mg/kg		1		ASA24-5	04/14/23 14:00 / srm
Nitrate as N, KCL Extract	20	mg/kg		1		ASA33-8	04/13/23 17:10 / srm
SIEVE ANALYSIS							
1 in (25 mm), Retained	< 0.1	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
No. 10 (2 mm), Retained	13.9	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
Pan	86.1	wt%-dry		0.1		SSSA 15-2	04/12/23 09:15 / srm
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	61	mg/kg	D	3		SW6010B	04/13/23 20:25 / jpv

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
D - Reporting Limit (RL) increased due to sample matrix
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Pioneer Technical Services **Work Order:** B23040585 **Report Date:** 04/14/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **ASA10-3**										Batch: 177665
Lab ID: **B23040585-001A DUP**	Sample Duplicate					Run: MISC-SOIL_230414A				04/14/23 10:00
Conductivity, sat. paste		1.18	mmhos/cm	0.10				0.9	30	
Lab ID: **B23040585-011A DUP**	Sample Duplicate					Run: MISC-SOIL_230414A				04/14/23 10:00
Conductivity, sat. paste		2.07	mmhos/cm	0.10				14	30	
Lab ID: **LCS-2304141000**	Laboratory Control Sample					Run: MISC-SOIL_230414A				04/14/23 10:00
Conductivity, sat. paste		5.02	mmhos/cm	0.10	98	70	130			
Lab ID: **B23040585-001A DUP**	Sample Duplicate					Run: MISC-SOIL_230414A				04/14/23 10:00
pH, sat. paste		7.20	s.u.	0.10				1.4	10	
Lab ID: **B23040585-011A DUP**	Sample Duplicate					Run: MISC-SOIL_230414A				04/14/23 10:00
pH, sat. paste		7.50	s.u.	0.10				0.0	10	
Lab ID: **LCS-2304141000**	Laboratory Control Sample					Run: MISC-SOIL_230414A				04/14/23 10:00
pH, sat. paste		7.20	s.u.	0.10	96	90	110			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Pioneer Technical Services **Work Order:** B23040585 **Report Date:** 04/14/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **ASA15-5**									Batch: R400388	
Lab ID: **B23040585-001A DUP**	3	Sample Duplicate				Run: MISC-SOIL_230414A			04/14/23 10:03	
Sand		57.0	%	1.0				1.8	30	
Silt		33.0	%	1.0				3.0	30	
Clay		10.0	%	1.0				0.0	30	
Lab ID: **B23040585-010A DUP**	3	Sample Duplicate				Run: MISC-SOIL_230414A			04/14/23 10:03	
Sand		54.0	%	1.0				1.9	30	
Silt		34.0	%	1.0				5.7	30	
Clay		12.0	%	1.0				8.7	30	
Lab ID: **LCS-2304141003**	3	Laboratory Control Sample				Run: MISC-SOIL_230414A			04/14/23 10:03	
Sand		41.0	%	1.0	114	70	130			
Silt		40.0	%	1.0	95	70	130			
Clay		19.0	%	1.0	86	70	130			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Pioneer Technical Services **Work Order:** B23040585 **Report Date:** 04/14/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **ASA24-5**									Batch: OM_4-14-2023_12-51-08PMA	
Lab ID: **LCS**	Laboratory Control Sample					Run: FIA205-B_230414B			04/14/23 13:06	
Phosphorus, Olsen		15	mg/kg	1.0	98	70	130			
Lab ID: **MBLK-NaHCO3**	Method Blank					Run: FIA205-B_230414B			04/14/23 13:10	
Phosphorus, Olsen		0.4	mg/kg	0.1						
Lab ID: **B23040585-005ADUP**	Sample Duplicate					Run: FIA205-B_230414B			04/14/23 13:39	
Phosphorus, Olsen		38	mg/kg	1.0				0.5	30	
Lab ID: **B23040585-005AMS**	Sample Matrix Spike					Run: FIA205-B_230414B			04/14/23 13:41	
Phosphorus, Olsen		50	mg/kg	1.0	114	70	130			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Pioneer Technical Services **Work Order:** B23040585 **Report Date:** 04/14/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **ASA29-3**										Batch: R400357
Lab ID: **MBLK**	Method Blank					Run: MISC-SOIL_230413B				04/13/23 14:52
Organic Matter		ND	%	0.02						
Lab ID: **LCS**	Laboratory Control Sample					Run: MISC-SOIL_230413B				04/13/23 14:52
Organic Matter		4.19	%	0.17	107	70	130			
Lab ID: **B23040585-010ADUP**	Sample Duplicate					Run: MISC-SOIL_230413B				04/13/23 14:52
Organic Matter		2.31	%	0.17				2.2	30	

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Pioneer Technical Services **Work Order:** B23040585 **Report Date:** 04/14/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **ASA33-8**									Batch: OM_4-13-2023_04-04-51PM	
Lab ID: **LCS**	Laboratory Control Sample					Run: FIA205-B_230414A			04/13/23 16:06	
Nitrate as N, KCL Extract		4.67	mg/kg	1.0	99	70	130			
Lab ID: **MBLK-KCL**	Method Blank					Run: FIA205-B_230414A			04/13/23 16:07	
Nitrate as N, KCL Extract		ND	mg/kg	0.1						
Lab ID: **B23040585-003ADUP**	Sample Duplicate					Run: FIA205-B_230414A			04/13/23 17:00	
Nitrate as N, KCL Extract		5.65	mg/kg	1.0				1.8	30	
Lab ID: **B23040585-003AMS**	Sample Matrix Spike					Run: FIA205-B_230414A			04/13/23 17:00	
Nitrate as N, KCL Extract		11.4	mg/kg	1.0	108	70	130			
Lab ID: **B23040585-013ADUP**	Sample Duplicate					Run: FIA205-B_230414A			04/13/23 17:08	
Nitrate as N, KCL Extract		17.4	mg/kg	1.0				5.6	30	
Lab ID: **B23040585-013AMS**	Sample Matrix Spike					Run: FIA205-B_230414A			04/13/23 17:09	
Nitrate as N, KCL Extract		24.5	mg/kg	1.0	116	70	130			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Pioneer Technical Services **Work Order:** B23040585 **Report Date:** 04/14/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **Calculation**										Batch: R400391
Lab ID: **B23040585-001ADUP**	Sample Duplicate					Run: MISC-SOIL_230414B				04/14/23 14:40
Sodium Adsorption Ratio (SAR)		0.360	unitless	0.010				2.7	30	
Lab ID: **B23040585-011ADUP**	Sample Duplicate					Run: MISC-SOIL_230414B				04/14/23 14:40
Sodium Adsorption Ratio (SAR)		0.910	unitless	0.010				10	30	
Lab ID: **LCS-2304141440**	Laboratory Control Sample					Run: MISC-SOIL_230414B				04/14/23 14:40
Sodium Adsorption Ratio (SAR)		9.80	unitless	0.010	104	70	130			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Pioneer Technical Services **Work Order:** B23040585 **Report Date:** 04/14/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6010B										Batch: 177632
Lab ID: MB-177632		Method Blank				Run: ICP204-B_230413A				04/13/23 18:02
Potassium		2	mg/kg	0.01						
Lab ID: LCS-177632		Laboratory Control Sample				Run: ICP204-B_230413A				04/13/23 18:07
Potassium		270	mg/kg	3.0	88	70	130			
Lab ID: B23040585-001ADUP		Sample Duplicate				Run: ICP204-B_230413A				04/13/23 18:23
Potassium		257	mg/kg	3.0				2.6	30	
Lab ID: B23040585-002AMS2		Sample Matrix Spike				Run: ICP204-B_230413A				04/13/23 18:31
Potassium		5780	mg/kg	3.1	113	70	130			
Lab ID: B23040585-011ADUP		Sample Duplicate				Run: ICP204-B_230413A				04/13/23 20:09
Potassium		216	mg/kg	3.0				1.4	30	
Lab ID: B23040585-012AMS2		Sample Matrix Spike				Run: ICP204-B_230413A				04/13/23 20:17
Potassium		5660	mg/kg	3.1	110	70	130			
Method: SW6010B										Batch: 177665
Lab ID: MB-177665	3	Method Blank				Run: ICP204-B_230413A				04/13/23 20:50
Calcium, sat. paste		ND	meq/L	0.006						
Magnesium, sat. paste		ND	meq/L	0.003						
Sodium, sat. paste		ND	meq/L	0.01						
Lab ID: LCS-177665	3	Laboratory Control Sample				Run: ICP204-B_230413A				04/13/23 20:54
Calcium, sat. paste		15.4	meq/L	0.075	114	70	130			
Magnesium, sat. paste		6.84	meq/L	0.082	94	70	130			
Sodium, sat. paste		32.6	meq/L	0.065	112	70	130			
Lab ID: B23040585-001ADUP	3	Sample Duplicate				Run: ICP204-B_230413A				04/13/23 21:03
Calcium, sat. paste		9.02	meq/L	0.050				1.3	30	
Magnesium, sat. paste		2.73	meq/L	0.082				0.7	30	
Sodium, sat. paste		0.868	meq/L	0.043				1.9	30	
Lab ID: B23040585-002AMS2	3	Sample Matrix Spike				Run: ICP204-B_230413A				04/13/23 21:11
Calcium, sat. paste		13.2	meq/L	0.050	99	70	130			
Magnesium, sat. paste		11.1	meq/L	0.082	103	70	130			
Sodium, sat. paste		5.42	meq/L	0.043	102	70	130			
Lab ID: B23040585-011ADUP	3	Sample Duplicate				Run: ICP204-B_230413A				04/13/23 22:00
Calcium, sat. paste		14.6	meq/L	0.075				9.9	30	
Magnesium, sat. paste		4.36	meq/L	0.082				8.6	30	
Sodium, sat. paste		2.79	meq/L	0.065				5.5	30	
Lab ID: B23040585-012AMS2	3	Sample Matrix Spike				Run: ICP204-B_230413A				04/13/23 22:09
Calcium, sat. paste		17.5	meq/L	0.050	96	70	130			
Magnesium, sat. paste		12.4	meq/L	0.082	103	70	130			
Sodium, sat. paste		6.45	meq/L	0.043	103	70	130			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Pioneer Technical Services **Work Order:** B23040585 **Report Date:** 04/14/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **USDA27a**										Batch: 177665
Lab ID: **B23040585-001A DUP**	Sample Duplicate					Run: MISC-SOIL_230414A				04/14/23 10:00
Saturation		34.5	%	0.10				6.7	30	
Lab ID: **B23040585-011A DUP**	Sample Duplicate					Run: MISC-SOIL_230414A				04/14/23 10:00
Saturation		40.1	%	0.10				3.9	30	
Lab ID: **LCS-2304141000**	Laboratory Control Sample					Run: MISC-SOIL_230414A				04/14/23 10:00
Saturation		35.3	%	0.10	93	70	130			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

Work Order Receipt Checklist

Pioneer Technical Services

B23040585

Login completed by: Tabitha Edwards
Date Received: 4/11/2023

Reviewed by: ysmith
Received by: kkw

Reviewed Date: 4/12/2023
Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Applicable ☐
Container/Temp Blank temperature:	12.2°C No Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

The reference date for Radon analysis is the sample collection date. The reference date for all other Radiochemical analyses is the analysis date. Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

Contact and Corrective Action Comments:

The Temperature Blank temperature for shipping container 1 was 11.9°C and shipping container 2 was 12.2°C.

Laboratory Management Program LaMP Chain of Custody Record

BP Site Node Path: _____ Req Due Date (mm/dd/yy): _____ Rush TAT: XX No ____

BP Facility No: _____ Lab Work Order Number: B23040385

Lab Name: Energy Laboratories	Facility Address:	Consultant/Contractor: Pioneer Technical Services	
Lab Address: 1120 S 27th St. Billings MT 59101	City, State, ZIP Code:	Consultant/Contractor Project No: BPSOU Park Sampling	
Lab PM: Gina McCartney	Lead Regulatory Agency:	Address: 307 E Park Suite 421, Anaconda MT, 59711	
Lab Phone: 800-735-4489	California Global ID No.:	Consultant/Contractor PM: Jesse Schwarzrock	
Lab Shipping Accnt:	Enfos Proposal No:	Phone: 406-697-0949	Email: jschwarzrock@pioneer-technical.com
Lab Bottle Order No:	Accounting Mode: Provision — — —	Email EDD To: Jesse Schwarzrock	
Other Info:	Stage: Activity:	Invoice To: BP —	Contractor —X
BP Project Manager (PM): Mike Mc Anulty			
BP PM Phone: 406-723-1822			
BP PM Email: mcanumc@bp.com			

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Water / Liquid	Air / Vapor	Is this location a well?	No. Containers / Preservative: Total Number of Containers	Unpreserved	H2SO4	HNO3	HCl	Methanol			Requested Analyses: Texture USDA	% Course Material (1" and 2mm)	Saturation Percentage	Electrical Conductivity	Sodium Adsorption Ratio	Saturated Paste pH	Organic Matter (Walkley Black)	Nutrients (N-P-K)			Report Type & QC Level: Standard —X / Full Data Package —
	23-ICS-0406-1	04/06/23	1350	X					X							X	X	X	X	X	X	X	X			RUSH TURNAROUND
	23-ICS-0406-2	04/06/23	1355	X					X							X	X	X	X	X	X	X	X			RUSH TURNAROUND
	23-ICS-0406-3	04/06/23	1400	X					X							X	X	X	X	X	X	X	X			RUSH TURNAROUND
	23-ICS-0406-4	04/06/23	1405	X					X							X	X	X	X	X	X	X	X			RUSH TURNAROUND
	23-ICS-0406-5	04/06/23	1410	X					X							X	X	X	X	X	X	X	X			RUSH TURNAROUND
	23-ICS-0406-6	04/06/23	1415	X					X							X	X	X	X	X	X	X	X			RUSH TURNAROUND
	23-ICS-0406-7	04/06/23	1420	X					X							X	X	X	X	X	X	X	X			RUSH TURNAROUND
	23-ICS-0406-8	04/06/23	1425	X					X							X	X	X	X	X	X	X	X			RUSH TURNAROUND

Note: If sample not collected, indicate "No Sample" in comments and single-strike out

Comments

Sampler's Name: Cole Dallaserra	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Pioneer Technical Services	Molly Spurgeon / PTS	4/10/23	1500	Keely Wilson / ELT	4/11/23	09:00
Shipment Method: Fedex Ship Date: 4-10-23						
Shipment Tracking No:						

Special Instructions: all samples here in cooler / KW 4/11/23

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: _____ °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

bp rm Laboratory Management Program LaMP Chain of Custody Record

BP Site Node Path: _____ Req Due Date (mm/dd/yy): _____ Rush TAT: XX No ____

BP Facility No: _____ Lab Work Order Number: B23040585

Lab Name: Energy Laboratories	Facility Address:	Consultant/Contractor: Pioneer Technical Services
Lab Address: 1120 S 27th St. Billings MT 59101	City, State, ZIP Code:	Consultant/Contractor Project No: BPSOU Park Sampling
Lab PM: Gina McCartney	Lead Regulatory Agency:	Address: 307 E Park Suite 421, Anaconda MT, 59711
Lab Phone: 800-735-4489	California Global ID No.:	Consultant/Contractor PM: Jesse Schwarzrock
Lab Shipping Accnt:	Enfos Proposal No:	Phone: 406-697-0949 Email: jschwarzrock@pioneer-technical.com
Lab Bottle Order No:	Accounting Mode: Provision — — —	Email EDD To: Jesse Schwarzrock
Other Info:	Stage: Activity:	Invoice To: BP — Contractor —X
BP Project Manager (PM): Mike Mc Anulty		
BP PM Phone: 406-723-1822		
BP PM Email: mcanumc@bp.com		

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Water / Liquid	Air / Vapor	Is this location a well?	No. Containers / Preservative: Total Number of Containers	Unpreserved	H2SO4	HNO3	HCl	Methanol	Requested Analyses: Texture USDA	% Course Material (1" and 2mm)	Saturation Percentage	Electrical Conductivity	Sodium Adsorption Ratio	Saturated Paste pH	Organic Matter (Walkley Black)	Nutrients (N-P-K)			Report Type & QC Level: Comments
	23-ICS-0406-9	04/06/23	1430	X					X					X	X	X	X	X	X	X	X			RUSH TURNAROUND
	23-ICS-0406-10	04/06/23	1435	X					X					X	X	X	X	X	X	X	X			RUSH TURNAROUND
	23-ICS-0406-11	04/06/23	1440	X					X					X	X	X	X	X	X	X	X			RUSH TURNAROUND
	23-ICS-0406-12	04/06/23	1445	X					X					X	X	X	X	X	X	X	X			RUSH TURNAROUND
	23-ICS-0406-13	04/06/23	1450	X					X					X	X	X	X	X	X	X	X			RUSH TURNAROUND
	23-ICS-0406-14	04/06/23	1455	X					X					X	X	X	X	X	X	X	X			RUSH TURNAROUND

Standard —X

Full Data Package —

Note: If sample not collected, indicate "No Sample" in comments and single-strike out

Sampler's Name: Cole Dallaserra	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Pioneer Technical Services	Molly Sonnier / PTS	4/10/23	1500	Kelly Colclasure / ELI	4/11/23	09:00
Shipment Method: Fedex Ship Date: 4-10-23						
Shipment Tracking No:						

Special Instructions: all samples here in Cooler 2. KWC 4/11/23

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: _____ °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

April 18, 2023

Jesse Schwarzrock
Pioneer Technical Services
307 E Park
Suite 421
Anaconda, MT 59711

RE: Project: BPSOU Park Sampling
Pace Project No.: 10648736

Dear Jesse Schwarzrock:

Enclosed are the analytical results for sample(s) received by the laboratory on April 11, 2023. The results relate only to the samples included in this report. Results contained within this report conform to the most current version of the TNI standards, BP LaMP Technical Requirements Revision 12.1, and any applicable Quality Assurance Project Plan (QAPP), or Work Plan unless otherwise narrated in the body of this report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Minneapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6436
Project Manager

Enclosures

cc: Cole Dallaserra, Pioneer Technical
BPEquis UploadEmail, BP EQUIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Pace Analytical Services, LLC - Minneapolis MN
1700 Elm Street SE, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8 Tribal Water Systems+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
GMP+ Certification #: GMP050884
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: AI-03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Minnesota Dept of Ag Approval: via MN 027-053-137
Minnesota Petrofund Registration #: 1240
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification (A2LA) #: R-036
North Dakota Certification (MN) #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification (1700) #: CL101
Oklahoma Certification #: 9507
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Vermont Certification #: VT-027053137
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01
USDA Permit #: P330-19-00208

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10648736001	23-ICS-0406-1	Solid	04/06/23 13:50	04/11/23 08:50
10648736002	23-ICS-0406-1	Solid	04/06/23 13:50	04/11/23 08:50
10648736003	23-ICS-0406-2	Solid	04/06/23 13:55	04/11/23 08:50
10648736004	23-ICS-0406-2	Solid	04/06/23 13:55	04/11/23 08:50
10648736005	23-ICS-0406-3	Solid	04/06/23 14:00	04/11/23 08:50
10648736006	23-ICS-0406-3	Solid	04/06/23 14:00	04/11/23 08:50
10648736007	23-ICS-0406-4	Solid	04/06/23 14:05	04/11/23 08:50
10648736008	23-ICS-0406-4	Solid	04/06/23 14:05	04/11/23 08:50
10648736009	23-ICS-0406-5	Solid	04/06/23 14:10	04/11/23 08:50
10648736010	23-ICS-0406-5	Solid	04/06/23 14:10	04/11/23 08:50
10648736011	23-ICS-0406-6	Solid	04/06/23 14:15	04/11/23 08:50
10648736012	23-ICS-0406-6	Solid	04/06/23 14:15	04/11/23 08:50
10648736013	23-ICS-0406-7	Solid	04/06/23 14:20	04/11/23 08:50
10648736014	23-ICS-0406-7	Solid	04/06/23 14:20	04/11/23 08:50
10648736015	23-ICS-0406-8	Solid	04/06/23 14:25	04/11/23 08:50
10648736016	23-ICS-0406-8	Solid	04/06/23 14:25	04/11/23 08:50
10648736017	23-ICS-0406-9	Solid	04/06/23 14:30	04/11/23 08:50
10648736018	23-ICS-0406-9	Solid	04/06/23 14:30	04/11/23 08:50
10648736019	23-ICS-0406-10	Solid	04/06/23 14:35	04/11/23 08:50
10648736020	23-ICS-0406-10	Solid	04/06/23 14:35	04/11/23 08:50
10648736021	23-ICS-0406-11	Solid	04/06/23 14:40	04/11/23 08:50
10648736022	23-ICS-0406-11	Solid	04/06/23 14:40	04/11/23 08:50
10648736023	23-ICS-0406-12	Solid	04/06/23 14:45	04/11/23 08:50
10648736024	23-ICS-0406-12	Solid	04/06/23 14:45	04/11/23 08:50
10648736025	23-ICS-0406-13	Solid	04/06/23 14:50	04/11/23 08:50
10648736026	23-ICS-0406-13	Solid	04/06/23 14:50	04/11/23 08:50
10648736027	23-ICS-0406-14	Solid	04/06/23 14:55	04/11/23 08:50
10648736028	23-ICS-0406-14	Solid	04/06/23 14:55	04/11/23 08:50

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10648736001	23-ICS-0406-1	EPA 6020B	NN2	5	PASI-M
10648736002	23-ICS-0406-1	EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10648736003	23-ICS-0406-2	EPA 6020B	NN2	5	PASI-M
10648736004	23-ICS-0406-2	EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10648736005	23-ICS-0406-3	EPA 6020B	NN2	5	PASI-M
10648736006	23-ICS-0406-3	EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10648736007	23-ICS-0406-4	EPA 6020B	NN2	5	PASI-M
10648736008	23-ICS-0406-4	EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10648736009	23-ICS-0406-5	EPA 6020B	NN2	5	PASI-M
10648736010	23-ICS-0406-5	EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10648736011	23-ICS-0406-6	EPA 6020B	NN2	5	PASI-M
10648736012	23-ICS-0406-6	EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10648736013	23-ICS-0406-7	EPA 6020B	NN2	5	PASI-M
10648736014	23-ICS-0406-7	EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10648736015	23-ICS-0406-8	EPA 6020B	NN2	5	PASI-M
10648736016	23-ICS-0406-8	EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10648736017	23-ICS-0406-9	EPA 6020B	NN2	5	PASI-M
10648736018	23-ICS-0406-9	EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10648736019	23-ICS-0406-10	EPA 6020B	NN2	5	PASI-M
10648736020	23-ICS-0406-10	EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10648736021	23-ICS-0406-11	EPA 6020B	NN2	5	PASI-M
10648736022	23-ICS-0406-11	EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10648736023	23-ICS-0406-12	EPA 6020B	NN2	5	PASI-M
10648736024	23-ICS-0406-12	EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10648736025	23-ICS-0406-13	EPA 6020B	NN2	5	PASI-M

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SAMPLE ANALYTE COUNT

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10648736026	**23-ICS-0406-13**	EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10648736027	**23-ICS-0406-14**	EPA 6020B	NN2	5	PASI-M
10648736028	**23-ICS-0406-14**	EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M

PASI-M = Pace Analytical Services - Minneapolis

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PROJECT NARRATIVE

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Date: April 18, 2023

Samples analyzed for method 6020 arsenic and lead were analyzed after they were dried and sieved using a number 60 sieve.

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PROJECT NARRATIVE

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Method: **EPA 6020B**
Description: 6020B MET ICPMS
Client: BPAR-PIONEER-MT
Date: April 18, 2023

General Information:
14 samples were analyzed for EPA 6020B by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3050B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Method: **EPA 7471B**
Description: 7471B Mercury
Client: BPAR-PIONEER-MT
Date: April 18, 2023

General Information:
14 samples were analyzed for EPA 7471B by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7471B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-1 **Lab ID: 10648736001** Collected: 04/06/23 13:50 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**25.9**	mg/kg	0.49	0.14	1	04/17/23 09:44	04/18/23 11:54	7440-38-2	
Cadmium	**0.78**	mg/kg	0.079	0.029	1	04/17/23 09:44	04/18/23 11:54	7440-43-9	
Copper	**69.9**	mg/kg	0.99	0.30	1	04/17/23 09:44	04/18/23 11:54	7440-50-8	
Lead	**24.4**	mg/kg	0.49	0.092	1	04/17/23 09:44	04/18/23 11:54	7439-92-1	
Zinc	**92.8**	mg/kg	4.9	1.2	1	04/17/23 09:44	04/18/23 11:54	7440-66-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-1 **Lab ID: 10648736002** Collected: 04/06/23 13:50 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.021**	mg/kg	0.019	0.0084	1	04/13/23 09:50	04/13/23 13:50	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**8.2**	%	0.10	0.10	1		04/12/23 09:53		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-2 **Lab ID: 10648736003** Collected: 04/06/23 13:55 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**24.5**	mg/kg	0.49	0.14	1	04/17/23 09:44	04/18/23 12:00	7440-38-2	
Cadmium	**0.66**	mg/kg	0.079	0.029	1	04/17/23 09:44	04/18/23 12:00	7440-43-9	
Copper	**58.2**	mg/kg	0.99	0.30	1	04/17/23 09:44	04/18/23 12:00	7440-50-8	
Lead	**22.3**	mg/kg	0.49	0.092	1	04/17/23 09:44	04/18/23 12:00	7439-92-1	
Zinc	**79.1**	mg/kg	4.9	1.2	1	04/17/23 09:44	04/18/23 12:00	7440-66-6	

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-2 **Lab ID: 10648736004** Collected: 04/06/23 13:55 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.021**	mg/kg	0.019	0.0083	1	04/13/23 09:50	04/13/23 13:55	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**9.1**	%	0.10	0.10	1		04/12/23 09:53		N2

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-3 **Lab ID: 10648736005** Collected: 04/06/23 14:00 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**23.9**	mg/kg	0.49	0.14	1	04/17/23 09:44	04/18/23 12:12	7440-38-2	
Cadmium	**0.65**	mg/kg	0.079	0.029	1	04/17/23 09:44	04/18/23 12:12	7440-43-9	
Copper	**49.9**	mg/kg	0.99	0.30	1	04/17/23 09:44	04/18/23 12:12	7440-50-8	
Lead	**19.1**	mg/kg	0.49	0.092	1	04/17/23 09:44	04/18/23 12:12	7439-92-1	
Zinc	**164**	mg/kg	4.9	1.2	1	04/17/23 09:44	04/18/23 12:12	7440-66-6	

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-3 **Lab ID: 10648736006** Collected: 04/06/23 14:00 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.014J**	mg/kg	0.022	0.0096	1	04/13/23 09:50	04/13/23 13:57	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**10**	%	0.10	0.10	1		04/12/23 09:53		N2

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-4 **Lab ID: 10648736007** Collected: 04/06/23 14:05 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**23.5**	mg/kg	0.50	0.14	1	04/17/23 09:44	04/18/23 12:18	7440-38-2	
Cadmium	**0.98**	mg/kg	0.080	0.029	1	04/17/23 09:44	04/18/23 12:18	7440-43-9	
Copper	**72.9**	mg/kg	1.0	0.31	1	04/17/23 09:44	04/18/23 12:18	7440-50-8	
Lead	**25.8**	mg/kg	0.50	0.093	1	04/17/23 09:44	04/18/23 12:18	7439-92-1	
Zinc	**104**	mg/kg	5.0	1.2	1	04/17/23 09:44	04/18/23 12:18	7440-66-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-4 **Lab ID: 10648736008** Collected: 04/06/23 14:05 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.021**	mg/kg	0.020	0.0088	1	04/13/23 09:50	04/13/23 13:58	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**8.5**	%	0.10	0.10	1		04/12/23 09:53		N2

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-5 **Lab ID: 10648736009** Collected: 04/06/23 14:10 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**24.8**	mg/kg	0.49	0.14	1	04/17/23 09:44	04/18/23 12:24	7440-38-2	
Cadmium	**1.0**	mg/kg	0.079	0.029	1	04/17/23 09:44	04/18/23 12:24	7440-43-9	
Copper	**85.3**	mg/kg	0.99	0.30	1	04/17/23 09:44	04/18/23 12:24	7440-50-8	
Lead	**29.9**	mg/kg	0.49	0.092	1	04/17/23 09:44	04/18/23 12:24	7439-92-1	
Zinc	**105**	mg/kg	4.9	1.2	1	04/17/23 09:44	04/18/23 12:24	7440-66-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-5 **Lab ID: 10648736010** Collected: 04/06/23 14:10 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.032**	mg/kg	0.019	0.0082	1	04/13/23 09:50	04/13/23 14:00	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**8.8**	%	0.10	0.10	1		04/12/23 09:54		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-6 **Lab ID: 10648736011** Collected: 04/06/23 14:15 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**23.8**	mg/kg	0.50	0.14	1	04/17/23 09:44	04/18/23 12:31	7440-38-2	
Cadmium	**0.86**	mg/kg	0.079	0.029	1	04/17/23 09:44	04/18/23 12:31	7440-43-9	
Copper	**71.8**	mg/kg	0.99	0.30	1	04/17/23 09:44	04/18/23 12:31	7440-50-8	
Lead	**24.2**	mg/kg	0.50	0.092	1	04/17/23 09:44	04/18/23 12:31	7439-92-1	
Zinc	**96.8**	mg/kg	5.0	1.2	1	04/17/23 09:44	04/18/23 12:31	7440-66-6	

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-6 **Lab ID: 10648736012** Collected: 04/06/23 14:15 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.024**	mg/kg	0.020	0.0086	1	04/13/23 09:50	04/13/23 14:01	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**6.7**	%	0.10	0.10	1		04/12/23 09:54		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-7 **Lab ID: 10648736013** Collected: 04/06/23 14:20 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**23.2**	mg/kg	0.50	0.14	1	04/17/23 09:44	04/18/23 12:37	7440-38-2	
Cadmium	**0.70**	mg/kg	0.080	0.029	1	04/17/23 09:44	04/18/23 12:37	7440-43-9	
Copper	**57.7**	mg/kg	1.0	0.30	1	04/17/23 09:44	04/18/23 12:37	7440-50-8	
Lead	**21.2**	mg/kg	0.50	0.093	1	04/17/23 09:44	04/18/23 12:37	7439-92-1	
Zinc	**79.3**	mg/kg	5.0	1.2	1	04/17/23 09:44	04/18/23 12:37	7440-66-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-7 **Lab ID: 10648736014** Collected: 04/06/23 14:20 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.024**	mg/kg	0.019	0.0083	1	04/13/23 09:50	04/13/23 14:03	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**5.9**	%	0.10	0.10	1		04/12/23 09:54		N2

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-8 **Lab ID: 10648736015** Collected: 04/06/23 14:25 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**31.4**	mg/kg	0.50	0.14	1	04/17/23 09:44	04/18/23 12:52	7440-38-2	
Cadmium	**1.2**	mg/kg	0.080	0.029	1	04/17/23 09:44	04/18/23 12:52	7440-43-9	
Copper	**79.6**	mg/kg	1.0	0.31	1	04/17/23 09:44	04/18/23 12:52	7440-50-8	
Lead	**27.1**	mg/kg	0.50	0.093	1	04/17/23 09:44	04/18/23 12:52	7439-92-1	
Zinc	**96.1**	mg/kg	5.0	1.2	1	04/17/23 09:44	04/18/23 12:52	7440-66-6	

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-8 **Lab ID: 10648736016** Collected: 04/06/23 14:25 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.024**	mg/kg	0.020	0.0086	1	04/13/23 09:50	04/13/23 14:05	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**6.2**	%	0.10	0.10	1		04/12/23 09:54		N2

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-9 **Lab ID: 10648736017** Collected: 04/06/23 14:30 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**31.3**	mg/kg	0.49	0.14	1	04/17/23 09:44	04/18/23 12:58	7440-38-2	
Cadmium	**0.85**	mg/kg	0.079	0.029	1	04/17/23 09:44	04/18/23 12:58	7440-43-9	
Copper	**76.5**	mg/kg	0.99	0.30	1	04/17/23 09:44	04/18/23 12:58	7440-50-8	
Lead	**25.7**	mg/kg	0.49	0.092	1	04/17/23 09:44	04/18/23 12:58	7439-92-1	
Zinc	**95.5**	mg/kg	4.9	1.2	1	04/17/23 09:44	04/18/23 12:58	7440-66-6	

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-9 **Lab ID: 10648736018** Collected: 04/06/23 14:30 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.029**	mg/kg	0.021	0.0092	1	04/13/23 09:50	04/13/23 14:06	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**7.9**	%	0.10	0.10	1		04/12/23 09:55		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-10 **Lab ID: 10648736019** Collected: 04/06/23 14:35 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**27.8**	mg/kg	0.49	0.14	1	04/17/23 09:44	04/18/23 13:04	7440-38-2	
Cadmium	**0.67**	mg/kg	0.079	0.029	1	04/17/23 09:44	04/18/23 13:04	7440-43-9	
Copper	**64.6**	mg/kg	0.99	0.30	1	04/17/23 09:44	04/18/23 13:04	7440-50-8	
Lead	**22.9**	mg/kg	0.49	0.092	1	04/17/23 09:44	04/18/23 13:04	7439-92-1	
Zinc	**80.3**	mg/kg	4.9	1.2	1	04/17/23 09:44	04/18/23 13:04	7440-66-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-10 **Lab ID: 10648736020** Collected: 04/06/23 14:35 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.026**	mg/kg	0.021	0.0091	1	04/13/23 09:50	04/13/23 14:11	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**8.1**	%	0.10	0.10	1		04/12/23 09:55		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-11 **Lab ID: 10648736021** Collected: 04/06/23 14:40 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**36.0**	mg/kg	0.50	0.14	1	04/17/23 09:44	04/18/23 13:10	7440-38-2	
Cadmium	**0.85**	mg/kg	0.080	0.029	1	04/17/23 09:44	04/18/23 13:10	7440-43-9	
Copper	**78.6**	mg/kg	0.99	0.30	1	04/17/23 09:44	04/18/23 13:10	7440-50-8	
Lead	**25.9**	mg/kg	0.50	0.093	1	04/17/23 09:44	04/18/23 13:10	7439-92-1	
Zinc	**99.5**	mg/kg	5.0	1.2	1	04/17/23 09:44	04/18/23 13:10	7440-66-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-11 **Lab ID: 10648736022** Collected: 04/06/23 14:40 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.029**	mg/kg	0.021	0.0093	1	04/13/23 09:50	04/13/23 14:13	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**10.8**	%	0.10	0.10	1		04/12/23 09:55		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-12 **Lab ID: 10648736023** Collected: 04/06/23 14:45 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**32.0**	mg/kg	0.49	0.14	1	04/17/23 09:44	04/18/23 13:16	7440-38-2	
Cadmium	**0.82**	mg/kg	0.079	0.029	1	04/17/23 09:44	04/18/23 13:16	7440-43-9	
Copper	**71.4**	mg/kg	0.98	0.30	1	04/17/23 09:44	04/18/23 13:16	7440-50-8	
Lead	**22.7**	mg/kg	0.49	0.091	1	04/17/23 09:44	04/18/23 13:16	7439-92-1	
Zinc	**101**	mg/kg	4.9	1.2	1	04/17/23 09:44	04/18/23 13:16	7440-66-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-12 **Lab ID: 10648736024** Collected: 04/06/23 14:45 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.029**	mg/kg	0.019	0.0083	1	04/13/23 09:50	04/13/23 14:14	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**9.8**	%	0.10	0.10	1		04/12/23 09:55		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-13 **Lab ID: 10648736025** Collected: 04/06/23 14:50 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**35.5**	mg/kg	0.49	0.14	1	04/17/23 09:44	04/18/23 13:30	7440-38-2	
Cadmium	**0.84**	mg/kg	0.079	0.029	1	04/17/23 09:44	04/18/23 13:30	7440-43-9	
Copper	**67.2**	mg/kg	0.99	0.30	1	04/17/23 09:44	04/18/23 13:30	7440-50-8	
Lead	**22.9**	mg/kg	0.49	0.092	1	04/17/23 09:44	04/18/23 13:30	7439-92-1	
Zinc	**86.0**	mg/kg	4.9	1.2	1	04/17/23 09:44	04/18/23 13:30	7440-66-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-13 **Lab ID: 10648736026** Collected: 04/06/23 14:50 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.020**	mg/kg	0.020	0.0087	1	04/13/23 09:50	04/13/23 14:16	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**9.1**	%	0.10	0.10	1		04/12/23 09:55		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-14 **Lab ID: 10648736027** Collected: 04/06/23 14:55 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis								
Arsenic	**38.8**	mg/kg	0.49	0.14	1	04/17/23 09:44	04/18/23 13:36	7440-38-2	
Cadmium	**0.98**	mg/kg	0.079	0.029	1	04/17/23 09:44	04/18/23 13:36	7440-43-9	
Copper	**75.3**	mg/kg	0.99	0.30	1	04/17/23 09:44	04/18/23 13:36	7440-50-8	
Lead	**25.0**	mg/kg	0.49	0.092	1	04/17/23 09:44	04/18/23 13:36	7439-92-1	
Zinc	**93.5**	mg/kg	4.9	1.2	1	04/17/23 09:44	04/18/23 13:36	7440-66-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Sample: 23-ICS-0406-14 **Lab ID: 10648736028** Collected: 04/06/23 14:55 Received: 04/11/23 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.025**	mg/kg	0.020	0.0086	1	04/13/23 09:50	04/13/23 14:18	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	**9.1**	%	0.10	0.10	1		04/12/23 09:56		N2

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: BPSOU Park Sampling
Pace Project No.: 10648736

QC Batch: 875235
QC Batch Method: EPA 7471B
Analysis Method: EPA 7471B
Analysis Description: 7471B Mercury Solids
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10648736002, 10648736004, 10648736006, 10648736008, 10648736010, 10648736012, 10648736014, 10648736016, 10648736018, 10648736020, 10648736022, 10648736024, 10648736026, 10648736028

METHOD BLANK: 4615242 Matrix: Solid
Associated Lab Samples: 10648736002, 10648736004, 10648736006, 10648736008, 10648736010, 10648736012, 10648736014, 10648736016, 10648736018, 10648736020, 10648736022, 10648736024, 10648736026, 10648736028

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/kg	<0.0086	0.020	0.0086	04/13/23 13:39	

LABORATORY CONTROL SAMPLE: 4615243

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.44	0.48	109	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4615244 4615245

Parameter	Units	10648735002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	<0.0086	0.55	0.52	0.60	0.56	109	108	80-120	7	20	

SAMPLE DUPLICATE: 4615246

Parameter	Units	10648735002 Result	Dup Result	RPD	Max RPD	Qualifiers
Mercury	mg/kg	<0.0086	<0.0086		20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: BPSOU Park Sampling
Pace Project No.: 10648736

QC Batch: 875826
QC Batch Method: EPA 3050B
Analysis Method: EPA 6020B
Analysis Description: 6020B Solids UPD5
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10648736001, 10648736003, 10648736005, 10648736007, 10648736009, 10648736011, 10648736013, 10648736015, 10648736017, 10648736019, 10648736021, 10648736023, 10648736025, 10648736027

METHOD BLANK: 4618778 Matrix: Solid
Associated Lab Samples: 10648736001, 10648736003, 10648736005, 10648736007, 10648736009, 10648736011, 10648736013, 10648736015, 10648736017, 10648736019, 10648736021, 10648736023, 10648736025, 10648736027

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/kg	<0.14	0.49	0.14	04/18/23 11:07	
Cadmium	mg/kg	<0.029	0.079	0.029	04/18/23 11:07	
Copper	mg/kg	<0.30	0.98	0.30	04/18/23 11:07	
Lead	mg/kg	<0.091	0.49	0.091	04/18/23 11:07	
Zinc	mg/kg	<1.2	4.9	1.2	04/18/23 11:07	

LABORATORY CONTROL SAMPLE: 4618779

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	49.6	50.9	103	80-120	
Cadmium	mg/kg	49.6	51.3	103	80-120	
Copper	mg/kg	49.6	53.0	107	80-120	
Lead	mg/kg	49.6	54.1	109	80-120	
Zinc	mg/kg	49.6	53.0	107	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4618781 4618782

Parameter	Units	10648735001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	7.1	49.9	50	56.0	57.6	98	101	75-125	3	20	
Cadmium	mg/kg	0.19	49.9	50	49.9	50.9	100	102	75-125	2	20	
Copper	mg/kg	65.2	49.9	50	113	116	97	101	75-125	2	20	
Lead	mg/kg	9.7	49.9	50	59.9	61.3	101	103	75-125	2	20	
Zinc	mg/kg	67.4	49.9	50	116	118	97	101	75-125	1	20	

SAMPLE DUPLICATE: 4618780

Parameter	Units	10648735001 Result	Dup Result	RPD	Max RPD	Qualifiers
Arsenic	mg/kg	7.1	7.1	0	20	
Cadmium	mg/kg	0.19	0.19	1	20	
Copper	mg/kg	65.2	64.3	1	20	
Lead	mg/kg	9.7	9.6	1	20	
Zinc	mg/kg	67.4	66.6	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: BPSOU Park Sampling
Pace Project No.: 10648736

QC Batch: 875247
QC Batch Method: ASTM D2974
Analysis Method: ASTM D2974
Analysis Description: Dry Weight / %M by ASTM D2974
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10648736002, 10648736004, 10648736006, 10648736008, 10648736010, 10648736012, 10648736014, 10648736016, 10648736018, 10648736020, 10648736022, 10648736024, 10648736026, 10648736028

SAMPLE DUPLICATE: 4615274

Parameter	Units	10648698002 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	4.1	4.8	15	30	N2

SAMPLE DUPLICATE: 4615323

Parameter	Units	10648735002 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	14.9	13.7	8	30	N2

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: BPSOU Park Sampling
Pace Project No.: 10648736

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

N2	The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BPSOU Park Sampling
Pace Project No.: 10648736

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10648736001	**23-ICS-0406-1**	EPA 3050B	875826	EPA 6020B	875975
10648736003	**23-ICS-0406-2**	EPA 3050B	875826	EPA 6020B	875975
10648736005	**23-ICS-0406-3**	EPA 3050B	875826	EPA 6020B	875975
10648736007	**23-ICS-0406-4**	EPA 3050B	875826	EPA 6020B	875975
10648736009	**23-ICS-0406-5**	EPA 3050B	875826	EPA 6020B	875975
10648736011	**23-ICS-0406-6**	EPA 3050B	875826	EPA 6020B	875975
10648736013	**23-ICS-0406-7**	EPA 3050B	875826	EPA 6020B	875975
10648736015	**23-ICS-0406-8**	EPA 3050B	875826	EPA 6020B	875975
10648736017	**23-ICS-0406-9**	EPA 3050B	875826	EPA 6020B	875975
10648736019	**23-ICS-0406-10**	EPA 3050B	875826	EPA 6020B	875975
10648736021	**23-ICS-0406-11**	EPA 3050B	875826	EPA 6020B	875975
10648736023	**23-ICS-0406-12**	EPA 3050B	875826	EPA 6020B	875975
10648736025	**23-ICS-0406-13**	EPA 3050B	875826	EPA 6020B	875975
10648736027	**23-ICS-0406-14**	EPA 3050B	875826	EPA 6020B	875975
10648736002	**23-ICS-0406-1**	EPA 7471B	875235	EPA 7471B	875524
10648736004	**23-ICS-0406-2**	EPA 7471B	875235	EPA 7471B	875524
10648736006	**23-ICS-0406-3**	EPA 7471B	875235	EPA 7471B	875524
10648736008	**23-ICS-0406-4**	EPA 7471B	875235	EPA 7471B	875524
10648736010	**23-ICS-0406-5**	EPA 7471B	875235	EPA 7471B	875524
10648736012	**23-ICS-0406-6**	EPA 7471B	875235	EPA 7471B	875524
10648736014	**23-ICS-0406-7**	EPA 7471B	875235	EPA 7471B	875524
10648736016	**23-ICS-0406-8**	EPA 7471B	875235	EPA 7471B	875524
10648736018	**23-ICS-0406-9**	EPA 7471B	875235	EPA 7471B	875524
10648736020	**23-ICS-0406-10**	EPA 7471B	875235	EPA 7471B	875524
10648736022	**23-ICS-0406-11**	EPA 7471B	875235	EPA 7471B	875524
10648736024	**23-ICS-0406-12**	EPA 7471B	875235	EPA 7471B	875524
10648736026	**23-ICS-0406-13**	EPA 7471B	875235	EPA 7471B	875524
10648736028	**23-ICS-0406-14**	EPA 7471B	875235	EPA 7471B	875524
10648736002	**23-ICS-0406-1**	ASTM D2974	875247		
10648736004	**23-ICS-0406-2**	ASTM D2974	875247		
10648736006	**23-ICS-0406-3**	ASTM D2974	875247		
10648736008	**23-ICS-0406-4**	ASTM D2974	875247		
10648736010	**23-ICS-0406-5**	ASTM D2974	875247		
10648736012	**23-ICS-0406-6**	ASTM D2974	875247		
10648736014	**23-ICS-0406-7**	ASTM D2974	875247		
10648736016	**23-ICS-0406-8**	ASTM D2974	875247		
10648736018	**23-ICS-0406-9**	ASTM D2974	875247		
10648736020	**23-ICS-0406-10**	ASTM D2974	875247		
10648736022	**23-ICS-0406-11**	ASTM D2974	875247		
10648736024	**23-ICS-0406-12**	ASTM D2974	875247		
10648736026	**23-ICS-0406-13**	ASTM D2974	875247		
10648736028	**23-ICS-0406-14**	ASTM D2974	875247		

REPORT OF LABORATORY ANALYSIS

Laboratory Management Program LaMP Chain of Custody Record

BP Site Node Path: _____ Req Due Date (mm/dd/yy): _____ Rush TAT: XX No ____

BP Facility No: _____ Lab Work Order Number: _____

Lab Name: Pace Analytical Services	Facility Address:	Consultant/Contractor: Pioneer Technical Services
Lab Address: 1700 Elm Street Minneapolis, MN 55414	City, State, ZIP Code:	Consultant/Contractor Project No: BPSOU Park Sampling
Lab PM: Jennifer Anderson	Lead Regulatory Agency:	Address: 307 E Park Suite 421, Anaconda MT, 59711
Lab Phone: 612-607-1700	California Global ID No.:	Consultant/Contractor PM: Jesse Schwarzrock
Lab Shipping Accnt:	Enfos Proposal No:	Phone: 406-697-0949 Email: jschwarzrock@pioneer-technical.com
Lab Bottle Order No:	Accounting Mode: Provision — — —	Email EDD To: Jesse Schwarzrock
Other Info:	Stage: Activity:	Invoice To: BP — Contractor X

BP Project Manager (PM): Mike Mc Anulty

BP PM Phone: 406-723-1822

BP PM Email: mcanumc@bp.com

Report Type & QC Level: Standard X; Full Data Package —

Note: If sample not collected, indicate "No

WO#: 10648736

10648736

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor	Matrix: Is this location a well?	No. Containers / Preservative: Total Number of Containers	Unpreserved	H2SO4	HNO3	HCl	Methanol	Requested Analyses: Air dry&sieve*, 6020 (As, Cd, Cu, Pb, Zn)	Requested Analyses: 7471 Mercury, dry weight	Report Type & QC Level
	23-ICS-0406-1	04/06/23	1350	X				2						X	X	RUSH TURNAROUND
	23-ICS-0406-2	04/06/23	1355	X				2						X	X	RUSH TURNAROUND
	23-ICS-0406-3	04/06/23	1400	X				2						X	X	RUSH TURNAROUND
	23-ICS-0406-4	04/06/23	1405	X				2						X	X	RUSH TURNAROUND
	23-ICS-0406-5	04/06/23	1410	X				2						X	X	RUSH TURNAROUND
	23-ICS-0406-6	04/06/23	1415	X				2						X	X	RUSH TURNAROUND
	23-ICS-0406-7	04/06/23	1420	X				2						X	X	RUSH TURNAROUND
	23-ICS-0406-8	04/06/23	1425	X				2						X	X	RUSH TURNAROUND
	23-ICS-0406-9	04/06/23	1430	X				2						X	X	RUSH TURNAROUND
	23-ICS-0406-10	04/06/23	1435	X				2						X	X	RUSH TURNAROUND

		Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Name:	Cole Dallaserra						
Sampler's Company:	Pioneer Technical Services	Molly Spangler PTS	4/10/23	1500	[illegible] Pace	4/11/23	8:30
Shipment Method:	FedEx Overnight Ship Date: 4/10/2023						
Shipment Tracking No:	4278 9935 1770						

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: 1.2 °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

Laboratory Management Program LaMP Chain of Custody Record

BP Site Node Path: _____ Req Due Date (mm/dd/yy): _____ Rush TAT: XX No ____

BP Facility No: _____ Lab Work Order Number: _____

Lab Name: Pace Analytical Services	Facility Address:	Consultant/Contractor: Pioneer Technical Services
Lab Address: 1700 Elm Street Minneapolis, MN 55414	City, State, ZIP Code:	Consultant/Contractor Project No: BPSOU Park Sampling
Lab PM: Jennifer Anderson	Lead Regulatory Agency:	Address: 307 E Park Suite 421, Anaconda MT, 59711
Lab Phone: 612-607-1700	California Global ID No.:	Consultant/Contractor PM: Jesse Schwarzrock
Lab Shipping Accnt:	Enfos Proposal No:	Phone: 406-697-0949 Email: jschwarzrock@pioneer-technical.com
Lab Bottle Order No:	Accounting Mode: Provision ___ ___ ___	Email EDD To: Jesse Schwarzrock
Other Info:	Stage: Activity:	Invoice To: BP ___ Contractor ___ X

BP Project Manager (PM): Mike Mc Anulty

BP PM Phone: 406-723-1822

BP PM Email: mcanumc@bp.com

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor	Matrix: Is this location a well?	No. Containers / Preservative: Total Number of Containers	Unpreserved	H2SO4	HNO3	HCl	Methanol			Requested Analyses: Air dry&sieve*, 6020 (As, Cd, Cu, Pb, Zn)	Requested Analyses: 7471 Mercury, dry weight									Report Type & QC Level: Comments
	23-ICS-0406-11	04/06/23	1440	X				2								X	X									RUSH TURNAROUND
	23-ICS-0406-12	04/06/23	1445	X				2								X	X									RUSH TURNAROUND
	23-ICS-0406-13	04/06/23	1450	X				2								X	X									RUSH TURNAROUND
	23-ICS-0406-14	04/06/23	1455	X				2								X	X									RUSH TURNAROUND

Report Type & QC Level: Standard ___ x; Full Data Package ___

Note: If sample not collected, indicate "No"

Sampler's Name: Cole Dallaserra	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Pioneer Technical Services	Molly Spranger / PTS	4/10/23	1500	[signature] Vale	4/11/23	8:51
Shipment Method: FedEx Overnight Ship Date: 4/10/2023						
Shipment Tracking No: 4278 9935 1770						

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: 1.2 °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

Sample Condition Upon Receipt - ESI Tech Specs

Client Name: Pioneer Technical Sampling

Project #: WO#: 10648736
PM: JMA Due Date: 04/18/23
CLIENT: BP-PIONEER

Courier: ☑ FedEx ☐ UPS ☐ USPS ☐ Client ☐ Pace ☐ SpeeDee ☐ Commercial

Tracking Number: 427899351776 ☐ See Exceptions ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☑ Yes ☐ No **Seals Intact?** ☑ Yes ☐ No **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other **Temp Blank?** ☑ Yes ☐ No

Thermometer: ☐ T1 (0461) ☑ T2 (1336) ☐ T3 (0459) ☐ T4 (0254) ☐ T5 (0178) ☐ T6 (0235) ☐ T7 (0042) ☐ T8 (0775) ☐ T9 (0727) ☐ 01339252/1710 **Type of Ice:** ☑ Wet ☐ Blue ☐ Dry ☐ None ☑ Melted

Temp should be above freezing to 6 °C **Cooler temp Read w/Temp Blank:** 1.2 °C

Correction Factor: true **Cooler Temp Corrected w/temp blank:** 1.2 °C

Average Corrected Temp (no temp blank only): ____ °C ☐ See Exceptions ENV-FRM-MIN4-0142 ☐ 1 Container

USDA Regulated Soil: (☐ N/A, water sample/other: ____)

Date/Initials of Person Examining Contents: 4/11/23 ADC2

Did samples originate in a quarantine zone within the United States: AL, AR, AZ CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA (check maps)? ☐ Yes ☑ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

If Yes to either question, fill out a Regulated Soil Checklist (ENV-FRM-MIN4-0154) and include with SCUR/COC paperwork.

Location (Check one): ☐ Duluth ☑ Minneapolis ☐ Virginia

				COMMENTS
Chain of Custody Present and Filled Out?	☑ Yes	☐ No		1.
Chain of Custody Relinquished?	☑ Yes	☐ No		2.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	3.
Samples Arrived within Hold Time?	☑ Yes	☐ No		4.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E.coli ☐ BOD/cBOD ☐ Hex Chrom ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐ Other ____
Rush Turn Around Time Requested?	☑ Yes	☐ No		6.
Sufficient Sample Volume?	☑ Yes	☐ No		7.
Triple Volume Provided for MS/MSD (if more than 10 samples)?	☐ Yes	☐ No	☑ N/A	
Correct Containers Used?	☑ Yes	☐ No		8.
-Pace Containers Used?	☑ Yes	☐ No		
Containers Intact?	☑ Yes	☐ No		9.
Field Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	10. Is sediment visible in the dissolved container? ☐ Yes ☐ No
Is sufficient information available to reconcile the samples to the COC?	☑ Yes	☐ No		11. **If no, write ID/Date/Time of container below:** ☐ See Exceptions ENV-FRM-MIN4-0142
Matrix: ☐ Water ☑ Soil ☐ Oil ☐ Other				
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☑ N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO3, H2SO4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐ Yes	☐ No	☑ N/A	☐ NaOH ☐ HNO3 ☐ H2SO4 ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxins/PFAS (*If adding preservative to a container, it must be added to associated field and equipment blanks--verify with PM first.)	☐ Yes	☐ No	☑ N/A	Positive for Residual Chlorine? ☐ Yes ☐ No ☐ See Exceptions ENV-FRM-MIN4-0142
				pH Paper Lot #
				Residual Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐ Yes	☐ No	☑ N/A	13. ☐ See Exceptions ENV-FRM-MIN4-0142
Headspace in VOA Vials (greater than 6mm)?	☐ Yes	☐ No	☑ N/A	
3 Trip Blanks Present?	☐ Yes	☐ No	☑ N/A	14.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	Pace Trip Blank Lot # (if purchased): ____

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: 17:05	Temp: 1.2	Corrected Temp: 1.2
Time: 17:25	put in cooler	
Time:	Temp:	Corrected Temp:

CLIENT NOTIFICATION/RESOLUTION **Field Date Required?** ☐ Yes ☐ No

Person Contacted: ____ Date/Time: ____

Comments/Resolution: ____

Project Manager Review: [signature] **Date:** 04/11/2023

NOTE: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e., out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled By: ADC2 **Line:** (2)

402660519

Internal Transfer Chain of Custody

Pace Analytical®
www.pacelabs.com

[x] Samples Pre-Logged into eCOC.

State Of Origin: MT
Cert. Needed: [ ] Yes [x] No

Workorder: 10648736 **Workorder Name:** BPSOU Park Sampling

Owner Received Date: 4/10/2023 **Results Requested By:** 4/18/2023

Report To	Subcontract To
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Minneapolis, MN 55414 Phone (612)607-6436	Pace Analytical Green Bay 1241 Bellevue Street Suite 9 Green Bay, WI 54302 Phone (920)469-2436

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: Other	Preserved Containers: PR	Preserved Containers:	Preserved Containers:	Preserved Containers:	Preserved Containers:	Requested Analysis: Air Dry & Sieve	Requested Analysis:	Requested Analysis:	Requested Analysis:	Requested Analysis:	Requested Analysis:	Requested Analysis:	Requested Analysis:	Requested Analysis:	Requested Analysis:	Requested Analysis:	Requested Analysis:	LAB USE ONLY
1	23-ICS-0406-1	PS	4/6/2023 00:00	10648736001	Solid	1						X												001
2	23-ICS-0406-2	PS	4/6/2023 00:00	10648736003	Solid	1						X												002
3	23-ICS-0406-3	PS	4/6/2023 00.00	10648736005	Solid	1						X												003
4	23-ICS-0406-4	PS	4/6/2023 00.00	10648736007	Solid	1						X												004
5	23-ICS-0406-5	PS	4/6/2023 00.00	10648736009	Solid	1						X												005
6	23-ICS-0406-6	PS	4/6/2023 00.00	10648736011	Solid	1						X												006
7	23-ICS-0406-7	PS	4/6/2023 00:00	10648736013	Solid	1						X												007
8	23-ICS-0406-8	PS	4/6/2023 00.00	10648736015	Solid	1						X												008
9	23-ICS-0406-9	PS	4/6/2023 00:00	10648736017	Solid	1						X												009
10	23-ICS-0406-10	PS	4/6/2023 00:00	10648736019	Solid	1						X												010
11	23-ICS-0406-11	PS	4/6/2023 00:00	10648736021	Solid	1						X												011
12	23-ICS-0406-12	PS	4/6/2023 00:00	10648736023	Solid	1						X												012
13	23-ICS-0406-13	PS	4/6/2023 00:00	10648736025	Solid	1						X												013
14	23-ICS-0406-14	PS	4/6/2023 00:00	10648736027	Solid	1						X												014

40260519

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	FedEx	04/11/2023 09:35	[illegible signature]	04/11/2023 09:35	IR40-Rush #60 Sieve
2					Include soil prep log
3					Follow QAPP

Cooler Temperature on Receipt ______ °C	**Custody Seal Y or N**	**Received on Ice Y or N**	**Samples Intact Y or N**

****In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.*

40260519

Laboratory Management Program LaMP Chain of Custody Record

BP Site Node Path: _____ Req Due Date (mm/dd/yy): _____ Rush TAT: XX No ___

BP Facility No: _____ Lab Work Order Number: _____

Lab Name: Pace Analytical Services	Facility Address:	Consultant/Contractor: Pioneer Technical Services
Lab Address: 1700 Elm Street Minneapolis, MN 55414	City, State, ZIP Code:	Consultant/Contractor Project No: BPSOU Park Sampling
Lab PM: Jennifer Anderson	Lead Regulatory Agency:	Address: 307 E Park Suite 421, Anaconda MT, 59711
Lab Phone: 612-607-1700	California Global ID No.:	Consultant/Contractor PM. Jesse Schwarzrock
Lab Shipping Accnt:	Enfos Proposal No:	Phone: 406-697-0949 Email: jschwarzrock@pioneer-technical com
Lab Bottle Order No:	Accounting Mode: Provision — — —	Email EDD To: Jesse Schwarzrock
Other Info:	Stage. Activity.	Invoice To. BP — Contractor — X

BP Project Manager (PM): Mike Mc Anulty

BP PM Phone. 406-723-1822

BP PM Email: mcanumc@bp com

Report Type & QC Level: Standard — x; Full Data Package —

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Water / Liquid	Air / Vapor	Is this location a well?	No. Containers / Preservative: Total Number of Containers	Unpreserved	H2SO4	HNO3	HCl	Methanol	Requested Analyses: Air dry&sieve*, 6020 (As, Cd, Cu, Pb, Zn)	7471 Mercury, dry weight	Comments (Note If sample not collected, indicate "No")
	23-ICS-0406-1	04/06/23	1350	X				2						X	X	RUSH TURNAROUND 001
	23-ICS-0406-2	04/06/23	1355	X				2						X	X	RUSH TURNAROUND 002
	23-ICS-0406-3	04/06/23	1400	X				2						X	X	RUSH TURNAROUND 003
	23-ICS-0406-4	04/06/23	1405	X				2						X	X	RUSH TURNAROUND 004
	23-ICS-0406-5	04/06/23	1410	X				2						X	X	RUSH TURNAROUND 005
	23-ICS-0406-6	04/06/23	1415	X				2						X	X	RUSH TURNAROUND 006
	23-ICS-0406-7	04/06/23	1420	X				2						X	X	RUSH TURNAROUND 007
	23-ICS-0406-8	04/06/23	1425	X				2						X	X	RUSH TURNAROUND 008
	23-ICS-0406-9	04/06/23	1430	X				2						X	X	RUSH TURNAROUND 009
	23-ICS-0406-10	04/06/23	1435	X				2						X	X	RUSH TURNAROUND 010

	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Name: Cole Dallaserra						
Sampler's Company. Pioneer Technical Services	Molly Sonnger / PTS	4/10/23	1350			
Shipment Method FedEx Overnight Ship Date: 4/10/2023	FedEX	04/11/2023	09:35	Matt VanSambeek Pace	04/11/23	09:35
Shipment Tracking No. 5150 1604 0959						

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place. Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: _____ °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

BP Remediation Management COC - Effective Date: starting August 16, 2011.

BP LaMP COC Rev. 8, 24 June 2012

402660519

Laboratory Management Program LaMP Chain of Custody Record

BP Site Node Path: _____ Req Due Date (mm/dd/yy): _____ Rush TAT: XX No ___

BP Facility No: _____ Lab Work Order Number: _____

Lab Name. Pace Analytical Services	Facility Address:	Consultant/Contractor. Pioneer Technical Services
Lab Address: 1700 Elm Street Minneapolis, MN 55414	City, State, ZIP Code:	Consultant/Contractor Project No: BPSOU Park Sampling
Lab PM: Jennifer Anderson	Lead Regulatory Agency:	Address. 307 E Park Suite 421, Anaconda MT, 59711
Lab Phone: 612-607-1700	California Global ID No :	Consultant/Contractor PM: Jesse Schwarzrock
Lab Shipping Accnt:	Enfos Proposal No:	Phone: 406-697-0949 Email: jschwarzrock@pioneer-technical.com
Lab Bottle Order No.	Accounting Mode: Provision — — —	Email EDD To: Jesse Schwarzrock
Other Info:	Stage: Activity.	Invoice To. BP — Contractor X

BP Project Manager (PM): Mike Mc Anulty

BP PM Phone: 406-723-1822

BP PM Email. mcanumc@bp com

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor	Matrix: Is this location a well?	No. Containers / Preservative: Total Number of Containers	Unpreserved	H2SO4	HNO3	HCl	Methanol	Requested Analyses: Air dry&sieve*, 6020 (As, Cd, Cu, Pb, Zn)	Requested Analyses: 7471 Mercury, dry weight	Report Type & QC Level / Comments
	23-ICS-0406-11	04/06/23	1440	X				2						X	X	RUSH TURNAROUND 0.11
	23-ICS-0406-12	04/06/23	1445	X				2						X	X	RUSH TURNAROUND 0.12
	23-ICS-0406-13	04/06/23	1450	X				2						X	X	RUSH TURNAROUND 0.13
	23-ICS-0406-14	04/06/23	1455	X				2						X	X	RUSH TURNAROUND 0.14

Report Type & QC Level: Standard — x; Full Data Package —

Note If sample not collected, indicate "No

	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Name. Cole Dallaserra						
Sampler's Company. Pioneer Technical Services	Mary Sprague PTS	4/10/23	1350			
Shipment Method: FedEx Overnight Ship Date: 4/10/2023	FedEx	04/11/2023	09:35	Matt Van Samleek Pace	04/11/2023	09:35
Shipment Tracking No: 5150 1604 0959						

Special Instructions:

THIS LINE - LAB USE ONLY. Custody Seals In Place: Yes / No	Temp Blank: Yes / No	Cooler Temp on Receipt. _____ °F/C	Trip Blank: Yes / No	MS/MSD Sample Submitted. Yes / No

Client Name: Pace Minneapolis

Sample Preservation Receipt Form

Project # 40260519

All containers needing preservation have been checked and noted below. ☐Yes ☐No ☐N/A

Initial when completed MVS Date/ Time:

Lab Lot# of pH paper. Lab Std #ID of preservation (if pH adjusted)

Pace Lab #	Glass							Plastic						Vials						Jars				General				VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
	AG1U	BG1U	AG1H	AG4S	AG5U	AG2S	BG3U	BP1U	BP3U	BP3B	BP3N	BP3S	BP2Z	VG9C	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U	WGFU	WPFU	SP5T	ZPLC	GN 1	GN 2							
001																																	2.5 / 5
002																																	2.5 / 5
003																																	2.5 / 5
004																																	2.5 / 5
005																																	2.5 / 5
006																																	2.5 / 5
007																																	2.5 / 5
008																																	2.5 / 5
009																																	2.5 / 5
010																																	2.5 / 5
011																																	2.5 / 5
012																																	2.5 / 5
013																																	2.5 / 5
014																																	2.5 / 5
015																																	2.5 / 5
016																																	2.5 / 5
017																																	2.5 / 5
018																																	2.5 / 5
019																																	2.5 / 5
020																																	2.5 / 5

04/11/2023 MVS

Exceptions to preservation check VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: _____ Headspace in VOA Vials (>6mm) ☐Yes ☐No ☐N/A *If yes look in headspace column

AG1U	1 liter amber glass
BG1U	1 liter clear glass
AG1H	1 liter amber glass HCL
AG4S	125 mL amber glass H2SO4
AG5U	100 mL amber glass unpres
AG2S	500 mL amber glass H2SO4
BG3U	250 mL clear glass unpres

BP1U	1 liter plastic unpres
BP3U	250 mL plastic unpres
BP3B	250 mL plastic NaOH
BP3N	250 mL plastic HNO3
BP3S	250 mL plastic H2SO4
BP2Z	500 mL plastic NaOH + Zn

VG9C	40 mL clear ascorbic w/ HCl
DG9T	40 mL amber Na Thio
VG9U	40 mL clear vial unpres
VG9H	40 mL clear vial HCL
VG9M	40 mL clear vial MeOH
VG9D	40 mL clear vial DI

JGFU	4 oz amber jar unpres
JG9U	9 oz amber jar unpres
WGFU	4 oz clear jar unpres
WPFU	4 oz plastic jar unpres
SP5T	120 mL plastic Na Thiosulfate
ZPLC	ziploc bag
GN 1	
GN 2	

Sample Condition Upon Receipt Form (SCUR)

Project #:

WO# : 40260519

40260519

Client Name: Pace Minneapolis

Courier: ☐ CS Logistics ☑ Fed Ex ☐ Speedee ☐ UPS ☐ Waltco ☐ Client ☐ Pace Other:

Tracking #: 515016040959

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Custody Seal on Samples Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other

Thermometer Used SR - 128 **Type of Ice:** Wet Blue Dry (None) ☐ Meltwater Only

Cooler Temperature Uncorr: 16.0 /Corr: 16.0

Temp Blank Present: ☑ yes ☐ no **Biological Tissue is Frozen:** ☐ yes ☐ no

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C if shipped on Dry Ice.

Person examining contents:
Date: 04/11/2023 Initials: MVS

Labeled By Initials: JA

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished.	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☐No ☑N/A	4. Pace IRWO MVS 04/11/2023
Samples Arrived within Hold Time:	☑Yes ☐No	5.
- DI VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time.
Short Hold Time Analysis (<72hr):	☐Yes ☑No	6.
Rush Turn Around Time Requested:	☑Yes ☐No	7.
Sufficient Volume: For Analysis: ☑Yes ☐No MS/MSD: ☐Yes ☑No ☐N/A		8.
Correct Containers Used:	☑Yes ☐No	9.
Correct Type: Pace Green Bay, Pace IR, (Non-Pace)		
Containers Intact:	☑Yes ☐No	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: S	☐Yes ☑No ☐N/A	12. Pace IRWO COC doesn't match sample times or times on Customer COC. All times on Pace IRWO COC listed @ 00:00. MVS 04/11/2023
Trip Blank Present:	☐Yes ☐No ☑N/A	13.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: If checked, see attached form for additional comments ☐

Person Contacted: Date/Time:

Comments/ Resolution: 12 continued actual time are are as follows: 001 13:50, 002 13:55, 003 14:00, 004 14:05, 005 14:10, 006 14:15, 007 14:20, 008 1425, 009 14:30, 010 14:35, 011 14:40, 012 14:45, 013 14:50, 014 14:55. MVS 04/11/2023

PM Review is documented electronically in LIMs. By releasing the project, the PM acknowledges they have reviewed the sample logi

Page 2 of 2

402600519

Internal Transfer Chain of Custody

Pace Analytical®
www.pacelabs.com

[x] Samples Pre-Logged into eCOC.

State Of Origin: MT
Cert. Needed: [ ] Yes [x] No
Owner Received Date: 4/10/2023 Results Requested By: 4/18/2023

Workorder: 10648736 **Workorder Name:** BPSOU Park Sampling

Report To	Subcontract To
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Minneapolis, MN 55414 Phone (612)607-6436	Pace Analytical Green Bay 1241 Bellevue Street Suite 9 Green Bay, WI 54302 Phone (920)469-2436

WO# : 10648736

10648736

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: Other	Preserved Containers: PB	Requested Analysis: Air Dry & Sieve	LAB USE ONLY
1	23-ICS-0406-1	PS	4/6/2023 00:00	10648736001	Solid	1		X	001
2	23-ICS-0406-2	PS	4/6/2023 00:00	10648736003	Solid	1		X	002
3	23-ICS-0406-3	PS	4/6/2023 00.00	10648736005	Solid	1		X	003
4	23-ICS-0406-4	PS	4/6/2023 00.00	10648736007	Solid	1		X	004
5	23-ICS-0406-5	PS	4/6/2023 00.00	10648736009	Solid	1		X	005
6	23-ICS-0406-6	PS	4/6/2023 00.00	10648736011	Solid	1		X	006
7	23-ICS-0406-7	PS	4/6/2023 00:00	10648736013	Solid	1		X	007
8	23-ICS-0406-8	PS	4/6/2023 00.00	10648736015	Solid	1		X	008
9	23-ICS-0406-9	PS	4/6/2023 00:00	10648736017	Solid	1		X	009
10	23-ICS-0406-10	PS	4/6/2023 00:00	10648736019	Solid	1		X	010
11	23-ICS-0406-11	PS	4/6/2023 00:00	10648736021	Solid	1		X	011
12	23-ICS-0406-12	PS	4/6/2023 00:00	10648736023	Solid	1		X	012
13	23-ICS-0406-13	PS	4/6/2023 00:00	10648736025	Solid	1		X	013
14	23-ICS-0406-14	PS	4/6/2023 00:00	10648736027	Solid	1		X	014

40260519

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	FedEx	04/11/2023 0935	Matt Pan Sample Receiving	4/11/2023 0935	IR40-Rush
2	[illegible]	4/14/23 1600	[illegible]	4/15/23	#60 Sieve
3				4:30	Include soil prep log
					Follow QAPP

Cooler Temperature on Receipt NA °C | Custody Seal Y or N (MA 4/17/23) | Received on Ice Y or N | Samples Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt

Client Name: Pace Green Bay

Project #: WO#: 10648736
PM: JMA Due Date: 04/18/23
CLIENT: BP-PIONEER

Courier: ☐ FedEx ☐ UPS ☐ USPS ☐ Client ☐ Pace ☐ SpeeDee ☑ Commercial

☐ See Exceptions ENV-FRM-MIN4-0142

Tracking Number: _____

Custody Seal on Cooler/Box Present? ☒ Yes ☐ No **Seals Intact?** ☒ Yes ☐ No **Biological Tissue Frozen?** ☐ Yes ☐ N/A

Packing Material: ☑ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other JMA 4/17/23 **Temp Blank?** ☐ Yes ☑ No

Thermometer: ☑ T1 (0461) ☐ T2 (1336) ☐ T3 (0459) ☐ T4 (0254) ☐ T5 (0178) ☐ T6 (0235) ☐ T7 (0042) ☐ T8 (0775) ☐ T9(0727) ☐ 01339252/1710 **Type of Ice:** ☐ Wet ☐ Blue ☐ Dry ☑ None ☐ Melted

Did Samples Originate in West Virginia? ☐ Yes ☑ No **Were All Container Temps Taken?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6 °C

Cooler temp Read w/Temp Blank: 4m6 °C

Correction Factor: +0.0 **Cooler Temp Corrected w/temp blank:** 4m6 °C

Average Corrected Temp (no temp blank only): _____ °C
☐ See Exceptions ENV-FRM-MIN4-0142 ☐ 1 Container

USDA Regulated Soil: (☐ N/A, water sample/other: _____)

Date/Initials of Person Examining Contents: 4/15/23 AD(2

Did samples originate in a quarantine zone within the United States: AL, AR, AZ CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA (check maps)? ☐ Yes ☑ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

If Yes to either question, fill out a Regulated Soil Checklist (ENV-FRM-MIN4-0154) and include with SCUR/COC paperwork.

Location (Check one): ☐ Duluth ☑ Minneapolis ☐ Virginia

				COMMENTS
Chain of Custody Present and Filled Out?	☑ Yes	☐ No		1.
Chain of Custody Relinquished?	☑ Yes	☐ No		2.
Sampler Name and/or Signature on COC?	☐ Yes	☐ No	☒ N/A	3. JMA 4/17/23
Samples Arrived within Hold Time?	☑ Yes	☐ No		4. If fecal: ☐ <8 hrs ☐ >8 hr, <24 ☐ No
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E.coli ☐ BOD/cBOD ☐ Hex Chrom ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐ Other
Rush Turn Around Time Requested?	☐ Yes	☑ No		6.
Sufficient Sample Volume?	☑ Yes	☐ No		7.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	8.
-Pace Containers Used?	☑ Yes	☐ No		
Containers Intact?	☑ Yes	☐ No		9.
Field Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	10. Is sediment visible in the dissolved container? ☐ Yes ☐ No
Is sufficient information available to reconcile the samples to the COC?	☑ Yes	☐ No		11. **If no, write ID/Date/Time of container below:** ☐ See Exceptions ENV-FRM-MIN4-0142
Matrix: ☐ Water ☑ Soil ☐ Oil ☐ Other				
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☑ N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO3, H2SO4, <2pH, NaOH >9 Sulfide, NaOH>10 Cyanide)	☐ Yes	☐ No	☑ N/A	☐ NaOH ☐ HNO3 ☐ H2SO4 ☐ Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxins/PFAS (*If adding preservative to a container, it must be added to associated field and equipment blanks--verify with PM first.)	☐ Yes	☐ No	☑ N/A	Positive for Residual Chlorine? ☐ Yes ☐ No ☐ See Exceptions ENV-FRM-MIN4-0142
				pH Paper Lot #
				Residual Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Headspace in Methyl Mercury Container?	☐ Yes	☐ No	☑ N/A	13.
Extra labels present on soil VOA or WIDRO containers?	☐ Yes	☐ No	☑ N/A	14. ☐ See Exceptions ENV-FRM-MIN4-0142
Headspace in VOA Vials (greater than 6mm)?	☐ Yes	☐ No	☑ N/A	
3 Trip Blanks Present?	☐ Yes	☐ No	☑ N/A	15.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	Pace Trip Blank Lot # (if purchased): _____

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: _____ **Date:** 04/17/2023

NOTE: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e., out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled By: AR2 **Line:** (1)

Attachment E
Geogrid Specification Sheet

LBO 202 Type 1 Biaxial Geogrid

TENAX LBO 202 is a polypropylene geogrid especially designed for soil stabilization and reinforcement applications. LBO 202 geogrids are manufactured from a unique process of extrusion and biaxial orientation to enhance tensile properties. TENAX LBO 202 geogrids feature consistently high tensile strength and modulus, excellent resistance to construction damage, and environmental exposure.

Typical Applications:
Soft soil stabilization, base reinforcement, embankments over soft soils, working platforms, haul roads

PRODUCT PROPERTIES

Technical Characteristics	Units	MD Values[1]	XMD Values[1]
Aperture Dimensions[2a]	mm (in)	27 (1.06)	37 (1.45)
Minimum Rib Thickness[2b]	mm (in)	0.76 (0.03)	0.76 (0.03)
Tensile Strength @ 2% Strain[3]	kN/m (lb/ft)	4.1 (280)	6.6 (450)
Tensile Strength @ 5% Strain[3]	kN/m (lb/ft)	8.5 (580)	13.4 (920)
Ultimate Tensile Strength[3]	kN/m (lb/ft)	12.4 (850)	19.0 (1,300)

STRUCTURAL INTEGRITY

Junction Efficiency[4]	%	93
Flexural Stiffness[5]	mg-cm	250,000
Aperture Stability[6]	m-N/deg	0.32

DURABILITY

Resistance to Installation Damage[7]	%SC/%SW/%GP	95/93/90
Resistance to Long Term Degradation[8]	%	100
Resistance to UV Degradation[9]	%	100

DIMENSIONS AND DELIVERY

The biaxial geogrid shall be delivered to the jobsite in roll form with each roll individually identified and nominally measuring 4m (13.1-FT) or 4.87m (16-FT) in width and 75m (246-FT) in length.

Notes

1. Unless indicated otherwise, values shown are minimum average roll values determined in accordance with ASTM D4759-02.
2. (a) Minimum average value (b) Nominal dimensions.
3. Tensile Strength is determined in accordance with ASTM D6637-01.
4. Load transfer capability determined in accordance with GRI-GG2-05 and expressed as a percentage of ultimate tensile strength.
5. Resistance to bending force determined in accordance with ASTM D5732-01, using specimens of width two ribs wide, with transverse ribs cut flush with exterior edges of longitudinal ribs (as a "ladder"), and of length sufficiently long to enable measurement of the overhang dimension. The overall flexural stiffness is calculated as the square root of the product MD and XMD flexural stiffness values.
6. Resistance to in-plane rotational movement measured by applying a 20 kg-cm (2 m-N) moment to the central junction of a 9-IN x 9-IN specimen restrained at its perimeter in accordance with US Army Corps of Engineers Methodology for measurement of torsional rigidity.
7. Resistance to loss of load capacity or structural integrity when subjected to mechanical installation stress om clayey sand (SC), well graded sand (SW), and crushed stone classified as poorly graded gravel (GP). The geogrid shall be sampled in accordance with ASTM D5818-06 and load capcity shall be determined in accordance with ASTM D6637-01.
8. Resistance to loss of load capacity or structural integrity when subjected to chemically aggressive environments.
9. Resistance to loss of load capacity or structural integrity when subjected to ultraviolet light aggressive weathering.

Made in USA
TENAX CORPORATION
4800 E. Monument Street / Baltimore, MD 21205
phone 410-522-7000 / fax 410-522-3190 / www.tenaxus.com

Attachment F
Drain Conveyance Rate Calculation Brief

Date:	6/25/23	Project:	RMAP Copper/Emmett Park	Prepared By:	RPM
Rev. No.	1	Office:	Butte, MT	Checked By:	
Rev. Date:		Calc. No.		Approved By:	
Subject:	Buried Drain Flow for Copper/Emmett Park Remediation				

Buried Drain Flow Rate at Copper/Emmett Park

Table of Contents

1 PURPOSE AND OBJECTIVES

During Site investigation, the northern portion of the Copper/Emmett Park was determined to have an area of shallow or surfacing groundwater. As part of planned remediation, this portion of the park will be subject to 14-inch removal of impacted soil, regrading, and placement of a new soil cap. In order to successfully implement the remedy and protect the remedy from future impacts of artesian groundwater, it has been determined that the remedy design will incorporate a drainage system to capture and convey the surfacing groundwater away from the Site.

At this time, the extent and source of the surfacing groundwater, groundwater chemistry, and potential maximum flow rates of the feature are unknown. In the adjacent property to the west, a similar artesian groundwater feature was discovered and routed away from the south side of building in 2007. This groundwater, surfacing approximately 100 feet southwest from the west end of the feature in Copper/Emmett Park, was determined to have elevated aqueous metal contaminants of concern (COCs). Flow rates from this feature are also unknown and may have changed after the 2017 earthquake. In Copper/Emmett Park, the surfacing groundwater feature was not observed to flow out of the Site on the surface at the time of investigation. Surfacing groundwater is lost to evapotranspiration, supporting well-established grass vegetation in the area of the feature. Once vegetation and existing topsoil are removed, flow from the feature will need to be controlled.

Rather than extensive investigation, the design will incorporate a drainage system conservatively sized to transmit more groundwater than is anticipated to be encountered. This calculation summary provides numerical support for the draft design by estimating the potential flow rates transmitted by the drain system. Although the spring flow is unknown, it is anticipated to remain well below the design flow of the drain system, effectively removing groundwater from the Site and preventing groundwater from reaching clean surface soil.

2 CALCULATIONS

Elevations and alignment of the perforated pipe and solid conveyance pipe used in these calculations were determined using AutoCAD Civil 3D. Draft construction details of the drain system are provided on Figure 5, Figure 6, and Figure 7 of the Remedial Action Work Plan

(RAWP). The drain system will consist of two runs of perforated 4-inch standard dimension ratio (SDR) 35 polyvinyl chloride (PVC) pipe along the south boundary of the drain feature. The perforated pipes will be buried in a gravel packed trench and come together in a gravel trench below the approximate low point of the spring feature. From this point, flow will be routed into a solid 4-inch SDR 35 PVC pipe, which will run south and connect to the existing 4" drain line running from the Safe Space building to the Butte-Silver Bow stormwater collection vault on the northwest corner of Copper Street and Emmet Avenue. The existing drain line from this wye to the stormwater vault will be removed and replaced with a run of 6" SDR 35 pipe, and reconnected to the vault. This vault then outflows to the Missoula Gulch storm water system (to Catch Basin 8, Catch Basin 9, and Lower Area One [LAO]).

Rather than estimate a specific spring flow rate based on evapotranspiration or other data, this calculation brief will provide the estimated normal or maximum flow rates for each of the design components listed above, including:

- Estimated flow of groundwater through the gravel trench.
- Maximum conveyance of the 4-inch perforated drainpipes.
- Maximum conveyance of the 4-inch and 6-inch solid pipes to the existing vault.

2.1 Gravel Pack Flow Rate

The flow of groundwater through the constructed gravel trench can be estimated using Darcy's law for groundwater flow. It can be written as follows:

$$Q = kiA$$

Where:

Q = flow rate (cubic feet per second)
k = hydraulic conductivity (feet per second)
i = hydraulic gradient (dimensionless)
A = cross-sectional area (square feet)

The estimated hydraulic conductivity of washed gravel can be very high. A hydraulic conductivity value within the expected range of clean gravel in an aquifer system was selected for the estimate, at 0.05 feet per second. As determined by the grade in AutoCAD, the average hydraulic gradient of the west gravel trench, which is the shallower grade of the two trench alignments, is 0.057. Given a minimum trench width of 1.5 feet, and a minimum trench depth of 3.33 feet, the minimum cross-sectional area of the rectangular trench used in the calculation is 4.95 feet. These calculations resulted in a flow rate of 0.014 cubic feet per second or 6.3 gallons per minute. However, the placement of the perforated pipe within the gravel trench will effectively 'short circuit' trench flow, and the overall conveyance rate of the trench will be governed by the perforated pipe flow.

2.2 Perforated Pipe Flow Rate

The orifice equation was used to calculate the capacity of the perforated pipe placed in the trench. The orifice equation is written as follows:

$$Q = L\, C_d A_O \sqrt{2gh}$$

Where:

Q = flow rate (cubic feet per second)
L = length of perforated pipe (feet)
C_d = coefficient of discharge (dimensionless)
A_o = open area ratio (feet squared per foot)
g = acceleration due to gravity (feet per second squared)
h = hydraulic head (feet)

Typically, when the orifice diameter is greater than the pipe wall thickness, the coefficient of discharge is estimated at 0.6, and when the orifice diameter is smaller than the pipe thickness, the coefficient of discharge is estimated at 0.8. With SDR 35 perforated PVC, a value of 0.6 is appropriate for this estimate. The open area ratio is the ratio of orifice area to pipe area. Although this value can vary between manufacturers, a typical value is approximately 0.013 feet squared per foot for perforated 4-inch PVC. Gravity is constant at 32.2 feet per second squared. Hydraulic head will likely vary seasonally, but a reasonable estimate in this installation is that head may not exceed the top of the pipe, so a head pressure equal to the pipe diameter, or 0.33 feet, was selected. The total length of perforated pipe is approximately 135 feet. The resulting maximum conveyance rate of the perforated pipe given these assumptions is calculated to be 4.9 cubic feet per second or roughly 2,211 gallons per minute.

2.3 Solid Pipe Flow Rates

Full pipe flow in the solid PVC drainpipe connecting the perforated pipe runs to the existing stormwater vault was determined using Manning's flow equation, as follows:

$$Q = \frac{1.46}{n}\, A\; R^{2/3}\, \sqrt{S}$$

Where:

Q = flow rate of pipe (cubic feet per second)
n = Manning's roughness coefficient (seconds per cubic root of feet)
A = cross-sectional area of pipe (square feet)
R = hydraulic radius of pipe (feet)
S = slope (dimensionless)

The estimated Manning's roughness coefficient (n) of PVC pipe with smooth interior walls is 0.009. The cross-sectional area of the pipe given a 4-inch inner diameter is 0.087 square feet. The hydraulic radius of a full pipe (where the wetted perimeter equals circumference) is D/4 or 0.083 feet. The average slope of the pipe between the perforated pipe wyes and the wye into the

existing drain line 0.065. Given these inputs, full pipe gravity flow at the design grade is estimated at 0.82 cubic feet per second or approximately 308 gallons per minute.

The pipe slope is estimated to be slightly lower from the wye junction with the existing pipe to the receiving manhole. The slope of the existing drain was estimated by potholing the depth to the top of pipe in two locations along the Emmett Street boulevard. Given the burial depth of the pipe in these two locations and ground surface elevation, the slope of the pipe leading to the location of the planned wye junction was approximated at 0.045. From the wye into this existing drain to the stormwater vault, the existing 4" drain line will be replaced with 6" pipe. The 6" pipe will be installed following the same grade as the existing line. The maximum flow rate of the new 6" pipe, following the existing grade as measured in the field, is 0.57 cubic feet per second or 758 gallons per minute.

3 CONCLUSION

Although the artesian feature flow rate is not known at this time, the design parameters are considered to be conservative and should accommodate much higher groundwater flow than anticipated. The estimated conveyance rates reflect the available slope, and therefore gravity head, available for conveyance of captured groundwater to the Butte-Silver Bow storm water collection point. Calculated flow rates reflect a conservatively oversized system to convey the unknown groundwater capture flow from the artesian feature.

4 DOCUMENT REVISION SUMMARY

Revision No.	Author	Version	Description	Date
Rev 0	RPM	1	Draft Copper/Emmett Park Soil RAWP Submittal	5/15/2023
Rev 1	RPM	2	Final Copper/Emmett Park Soil RAWP Submittal	6/27/2023